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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS OF THE SOCIETY

December 16th, 1914.—The meeting was called to order at 8.30 P. M.; Director George W. Fuller in the chair; Chas. Warren Hunt, Secretary; and present, also, 162 members and 26 guests.

A paper by D. D. Clarke, M. Am. Soc. C. E., entitled "Submerged Pipe Work at Portland, Oregon", was presented by the Secretary, who also read communications on the subject from Messrs. Clemens Herschel, Ben S. Morrow, and F. M. Randlett. The paper was discussed by Messrs. T. H. Wiggin, W. E. Spear, W. W. Brush, J. P. Hogan, C. D. Ward, Kenneth Allen, and R. C. Kellogg.

A paper by C. E. Smith, M. Am. Soc. C. E., entitled "History of Little Rock Junction Railway Bridge of the St. Louis, Iron Mountain and Southern Railway Company, Over the Arkansas River, at Little Rock, Arkansas, 1883-1914," was presented by the Secretary, who

also presented a communication on the subject from Mr. C. D. Purdon. The paper was discussed orally by Messrs. Henry H. Quimby and T. Kennard Thomson.

The Secretary announced the following deaths:

WILLIAM ROBERTS ECKART, of Palo Alto, Cal., elected Member, January 5th, 1881; died December 8th, 1914.

HENRY MARTYN ROOD, of Port Chester, N. Y., elected Member, December 3d, 1890; died November 24th, 1914.

WILLIAM PAUL HUFSCHMIDT, of Wiggins, Colo., elected Associate Member, October 4th, 1910; died August 13th, 1914.

WALLACE KING, JR., of New York City, elected Associate, December 4th, 1900; died October 31st, 1914.

Adjourned.

January 6th, 1915.—The meeting was called to order at 8.30 P. M.; Vice-President Gardner S. Williams in the chair; Chas. Warren Hunt, Secretary; and present, also, 140 members and 25 guests.

The minutes of the meetings of November 18th and December 2d, 1914, were approved as printed in *Proceedings* for December, 1914.

A paper by Samuel Tobias Wagner, M. Am. Soc. C. E., entitled "The Water-Proofing of Solid Steel-Floor Bridges" was presented by the author and illustrated with lantern slides.

The Secretary presented communications on the subject from Messrs. Albert J. Himes, William S. Babcock, Jonathan Jones, J. Lee Allen, and Glenn B. Woodruff.

The paper was discussed orally by Messrs. A. W. Carpenter, G. J. Ray, J. H. Fichthorn, J. B. W. Gardiner, F. Auryansen, T. Kennard Thomson, E. W. DeKnight, Henry W. Hodge, Henry H. Quimby, and the author.

The Secretary made the following announcement:

"A noteworthy incident in the history of the Profession of Engineering in the United States will be the inauguration of The Engineering Foundation on January 27th, 1915, in the Auditorium of the United Engineering Society in New York City.

"The Engineering Foundation is the name given to a fund to be administered for the advancement of the Arts and Sciences connected with Engineering and the benefit of Mankind, the basis of which is the initial gift of a considerable sum by a noted engineer.

"The American Society of Civil Engineers, The American Institute of Mining Engineers, The American Society of Mechanical Engineers, and The American Institute of Electrical Engineers, are to be represented equally in the administrative Board of The Engineering Foundation by election by the Board of Trustees of The United Engineering Society which has been made the custodian of the fund. All members

and friends of the Engineering Profession are invited to these inaugural ceremonies."

On account of lack of time, the Secretary was unable to announce the elections and transfers by the Board of Direction at its meeting of January 6th, 1915, but they are here included for the purpose of the record.

ELECTED AS MEMBERS

EDMUND RAYMOND KINSEY, St. Louis, Mo.
WILFRID VAN NEST POWELSON, New York City
FRANK REEVES, Buenos Aires, Argentine Republic
CLARENCE MORD ROGERS, Daytona, Fla.
WILLIAM EDWARD ROLFE, St. Louis, Mo.
STURGIS HOOPER THORNDIKE, Boston, Mass.

ELECTED AS ASSOCIATE MEMBERS

ELBERT CHRISTOPHER ALDRICH, Auburn, N. Y.
GEORGE FREDSON BAINE, Buenos Aires, Argentine Republic
ALFRED FORTIN BECK, Norfolk, Va.
WILLIAM HATRICK BECKER, Groveland, Cal.
ELBERT CALVIN BROWN, Manila, Philippine Islands
FRANK JEROME CAREW, New York City
JOHNSON CHAPMAN, Barfield, Ark.
NORMAN MOORE CHIVERS, Kings Bluff, N. C.
RICHARD VINCENT COLLINS, Hornell, N. Y.
EDWARD CLARENCE DOHM, Olympia, Wash.
CHARLES RAYMOND EGE, Olympia, Wash.
JOHN ARTHUR ELLIOTT, Wyeth, Ore.
WALTER WIER JOHNSTON, Anniston, Ala.
KARL RAYMOND KENNISON, Providence, R. I.
ALFRED FELLOWS MASURY, New York City
ARTHUR ONDERDONK, New York City
BERNARD ARNOLD RUGE, New York City
CHARLES BOONE SADLER, Baltimore, Md.
LEROY CLARKE SMITH, Lansing, Mich.
GEORGE GARDNER UNDERHILL, Santa Rosalia, Chih., Mexico
ANDERS BAGGE VILLADSEN, Salt Lake City, Utah
GERRIT WAALKES, Mt. Vernon, Ohio
JOHN PALMER WALKER, Juneau, Alaska
CARL AUGUST WIGHOLM, Oakland, Cal.
CLARENCE RICHARD YOUNG, Toronto, Ont., Canada

ELECTED AS ASSOCIATES

JOHN ALEXANDER BRITTON, San Francisco, Cal.
CLARK EDWIN MICKEY, Lincoln, Nebr.

Elected as Juniors

John Henning Anderson, Chicago, Ill.
Wilbur Earl Bickerton, Boston, Mass.
Walter Louis Connelly, Saginaw, Mich.
William Bullard Durant, Turners Falls, Mass.
Harold Laselle Fiske, Schenectady, N. Y.
Manuel Font, San Juan, Porto Rico
Walter Cleary Hopkins, Baltimore, Md.
Edwin Ambler Ingham, Berkeley, Cal.
Frederick Martin Kipp, Jr., Baltimore, Md.
John Lowery, Jr., Ambridge, Pa.
George Alfred Maney, Minneapolis, Minn.
Albertis Montgomery, Minneapolis, Minn.
Melvin Lyman Moone, Lansing, Mich.
Robert Bruce Murdock, Watertown, N. Y.
Jesse Thomas Osborn, Chicago, Ill.
Edmund Quincy, New York City
Richard Bennett Smith, Culebra, Canal Zone, Panama
James Leland Stanford, New York City
John Wright Taussig, New York City
Francis Montgomery Veatch, Lawrence, Kans.

Transferred from Associate Member to Member

Dudley Tibbits Corning, Troy, N. Y.
Louis Adolph Mitchell, Anderson, Ind.
Philip à Morley Parker, London, England
Stuart Sims, Iowa City, Iowa
Carl Henry Stengel, New York City
Albert Edwin Waldron, Washington, D. C.

Transferred from Junior to Associate Member

Arthur Frederick Blight, Los Angeles, Cal.
John Dubuis, Salem, Ore.
Walter Hanna Dunlap, Roanoke, Va.
Charles Lacey Hall, Manila, Philippine Islands
Frank Sampson Mason Harris, Oakland, Cal.
George William Howson, San Francisco, Cal.
Elmer Alfred Porter, Salt Lake City, Utah
Ernest Walker Sawyer, Newcastle, N. B., Canada
Arthur Louis Sherman, Patchogue, N. Y.
Nathan Newton Tiffany, East Hampton, N. Y.
Hugh Lemuel Wiley, Portland, Ore.

The Secretary announced the following deaths:

ROBERT MAXSON GREENE, of Winnipeg, Man., Canada, elected Associate Member, June 1st, 1898; Member, September 1st, 1908; died December 5th, 1914.

ELIPHALET W. BLATCHFORD, of Chicago, Ill., elected Fellow, February 6th, 1873; died January 25th, 1914.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

January 6th, 1915.—The Board met at 3 P. M.; Vice-President Smith in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bates, Bensel, Bush, Cooley, Cummings, Edwards, Endicott, Fuller, Haskell, Hodge, Leonard, Montfort, Swain, Thomson, Tuttle, and Williams.

*Regulations for Administering Admission Requirements were adopted.

†Rules for the Appointment, Government, and Procedure of Special Committees were adopted.

The Chairman was authorized to appoint Tellers to canvass the Ballot for Officers, and these Tellers were authorized to begin the canvass of the Ballots on the evening of Tuesday, January 19th, 1915.

A Report from the Committee to Recommend the Award of Medals and Prizes for 1914 was received, and the following awards were made in accordance with the recommendations of the Committee:

The Norman Medal to Caleb Mills Saville, M. Am. Soc. C. E., for his paper entitled "Hydrology of the Panama Canal."

The J. James R. Croes Medal to J. B. Lippincott, M. Am. Soc. C. E., for his paper entitled "Tufa Cement, as Manufactured and Used on the Los Angeles Aqueduct."

The Thomas Fitch Rowland Prize to H. T. Cory, M. Am. Soc. C. E., for his paper entitled "Irrigation and River Control in the Colorado River Delta."

The James Laurie Prize to Samuel Tobias Wagner, M. Am. Soc. C. E., for his paper entitled "The Elevation of the Tracks of the Philadelphia, Germantown and Norristown Railroad, Philadelphia, Pa."

The Collingwood Prize for Juniors to J. S. Longwell, Jun. Am. Soc. C. E., for his participation in the preparation of the paper (prepared jointly by him and Mr. W. G. Steward who is not a member of the Society), entitled "Experiments on Weir Discharge."

The Constitution of the recently formed Cleveland Association of Members of the Society was approved.

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* These will be printed in the February Number of *Proceedings*.

† See page 7.

The invitation to this Society to participate in the administration of the fund to be known as the Engineering Foundation, tendered to this Society by the United Engineering Society, was accepted.

$500 was appropriated for the use of the Joint Committee of the five National Societies on the reception of Foreign Engineers.

The Board approved the Ballot for Officers as issued.

Action was taken in regard to members in arrears for dues.

The resignations of 10 Members, 12 Associate Members, 2 Associates, and 14 Juniors, were accepted.

Ballots for membership were canvassed, resulting in the election of 6 Members, 25 Associate Members, 2 Associates, and 20 Juniors, and the transfer of 11 Juniors to the grade of Associate Member.

Six Associate Members were transferred to the grade of Member.

Applications were considered, and other routine business transacted.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

February 3d, 1915.—8.30 P. M.—At this meeting, two papers will will be presented for discussion, as follows: "Nomographic Solutions for Formulas of Various Types," by R. C. Strachan, M. Am. Soc. C. E.; and "Rivers and Railroads in the United States," by William W. Harts, M. Am. Soc. C. E.

Mr. Strachan's paper was printed in *Proceedings* for December, 1914, and Mr. Hart's paper is printed in this number of *Proceedings*.

February 17th, 1915.—8.30 P. M.—At this meeting, a paper by William G. Grove, Esq., and Henry Taylor, Assoc. M. Am. Soc. C. E., entitled "Reconstruction of the Norfolk and Western Railway Company's Bridge Over the Ohio River at Kenova, West Virginia," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

RULES ADOPTED BY THE BOARD OF DIRECTION FOR THE APPOINTMENT, GOVERNMENT, AND PROCEDURE OF SPECIAL COMMITTEES, JANUARY 6TH, 1915.

Authorization: The authorization of Special Committees is prescribed by Article VI, Section 12, of the Constitution of the Society. All Special Committees are subject to these regulations. The object of a Special Committee is to investigate and report upon the engineering subjects defined in its title or in an explanatory statement by the Board.

Personnel: Appointments on Committees are made by the Board of Direction from the Membership of the Society, and will continue from year to year, except when changes are announced by the Board. Before Members are appointed the Board shall have their assurance that the work of the Committee will have their interest and co-operation. A member of any Committee who does not take an active interest in its work and does not regularly attend its meetings during the year, nor render adequate service by correspondence, may be relieved, and the vacancy filled by the Board. A member of a Special Committee may retire as such upon request given in writing to the Secretary.

After the Board of Direction has appointed the Chairman of a Special Committee, the Board will consult with the Chairman as to the personnel of the Committee. Additional appointments on existing Committees shall be made only on the recommendation of, or with the approval of, such Committees.

Funds: The Chairman of each Special Committee as soon after the appointment of the Committee as possible shall prepare a budget of itemized expenses covering the requirements of the Committee for the remainder of that year; thereafter he shall submit a budget not more than 10 days after the Annual Meeting of the Society. These budgets shall be scrutinized and such appropriations approved as may, in the judgment of the Board of Direction, be considered expedient. All bills submitted by a Special Committee shall be approved by its Chairman and Secretary.

Expenses: Expenses for items other than stationery and postage shall not be assumed by the Society, unless such expenditures were incurred in pursuance of previous authorization of the Board or referred to in the annual budget.

Extraordinary expenses, such as purchase of instruments, salaries of special employees and traveling expenses must be specifically authorized and approved by the Chairman of the Committee concerned. The Chairman of each Special Committee shall return its tangible property and records to the Society on the completion of its work.

Officers: The officers of Special Committees shall be a Chairman, appointed by the Board of Direction, and a Secretary, elected by the Committee, who shall assume their duties immediately after appointment.

Duties of Officers: The Chairman shall preside at all meetings of the Committee, appoint all Sub-Committees unless otherwise directed, and be *ex officio* a member of all Sub-Committees.

The Secretary will be expected to attend all meetings of the Committee, keep a roll call of the Members in attendance, and record the minutes in a book kept for that purpose.

(*a*) He shall conduct the correspondence, and receive all communications addressed to the Committee, and furnish each Member a complete copy of all communications.

(*b*) He shall read the minutes at all meetings, and shall issue notices for all meetings and promptly inform Sub-Committees of their appointments and duties.

(*c*) He shall keep a memorandum of all expenses of the Committee. He shall prepare an abstract of the minutes of all meetings and forward same to the Board of Direction for publication in the monthly *Proceedings,* and shall perform such other duties as may be required of him.

Meetings: The Committee shall hold a meeting as soon as practicable after its appointment, at which time Sub-Committees on Organization and Scope of the work contemplated shall be appointed.

At least two regular meetings of the Committee shall be held each year, the time and place to be fixed by the Chairman. Special Meetings may be called at the option of the Chairman or at the request of the majority of the Committee; due notice of such meetings to be given to the Secretary of the Society and to the members of the Committee.

Reports: No final action on Committee reports may be taken except at a meeting called for that purpose. Final reports shall receive the approval of a majority of those voting. Dissenting Members may present minority reports individually or jointly. Those refraining from voting shall be named in the report.

The Reports of Special Committees shall be filed with the Secretary of the Society at least 60 days before the Annual Meeting.

Amendments: Changes in the above Rules may be adopted by any Committee only upon the approval of the Board of Direction.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In making a search it sometimes happens that references are found which are not readily accessible to the person for whom the search is made. In that case the material may be reproduced by photography, and this can be done for members at the cost of the work to the Society, which is small. This method is particularly useful when there are drawings or figures in the text, which would be very expensive to reproduce by hand.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings.*

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings,* and set down for presentation to a future meeting of the Society, and on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions.*

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings.*

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers (Denver, Colo.) are held on the

second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Roger W. Toll, 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, at 12.30 P. M., at the Albany Hotel.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Minutes of Meeting)

December 12th, 1914.—The meeting was called to order; President Vincent in the chair; Roger W. Toll, Secretary; and present also 18 members and guests.

The minutes of the meeting of November 21st, 1914, were read and approved.

It was announced that, until further notice, the weekly luncheons would be held on Wednesdays at 12.30 P. M., at the Albany Hotel.

H. S. Crocker was appointed to represent the Association at the meeting of the Presidents of the Local Associations to be held in New York City on January 20th-21st, 1915.

A paper by W. W. Curtis, on "Woods and Wood Preservation," was presented by the author, who illustrated his remarks with lantern slides. The subject was generally discussed by those present.

A vote of thanks was extended to Mr. Curtis for his paper.

Adjourned.

Atlanta Association

The Atlanta Association of Members of the American Society of Civil Engineers was organized on March 14th, 1912. The Association holds its meetings at the University Club, Atlanta, Ga.

At the meeting of the Association on December 29th, 1913, the new Chairman, John Ruddle, was installed, and Messrs. Park A. Dallis and G. R. Solomon were appointed members of the Executive Committee. T. P. Branch was elected Secretary.

Baltimore Association

On May 6th, 1914, the Baltimore Association of Members of the American Society of Civil Engineers was organized, a Constitution adopted, and the following officers were elected: J. E. Greiner, President; Francis Lee Stuart, First Vice-President; L. H. Beach, Second Vice-President; Harry D. Williar, Jr., Secretary-Treasurer; and Messrs. H. D. Bush, B. T. Fendall, B. P. Harrison, Calvin W. Hendrick, Oscar F. Lackey, M. A. Long, and A. A. Thompson, Directors.

At its meeting of September 2d, 1914, the Board of Direction considered and approved the proposed Constitution of the Baltimore Association of Members of the American Society of Civil Engineers.

Cleveland Association

At its meeting of January 6th, 1915, the Board of Direction considered and approved the proposed Constitution of the Cleveland Association of Members of the American Society of Civil Engineers.

The following officers have been elected: President, Willard Beahan; Vice-President, Robert Hoffmann; Secretary-Treasurer, George H. Tinker.

Louisiana Association

The Louisiana Association of Members of the American Society of Civil Engineers (New Orleans, La.) has been organized with the following officers: Frank M. Kerr, President; J. F. Coleman and W. B. Gregory, Vice-Presidents; A. M. N. Blamphin, Treasurer; and L. C. Datz, Secretary.

Northwestern Association

At its meeting of November 4th, 1914, the Board of Direction considered and approved the proposed Constitution of the Northwestern Association of Members of the American Society of Civil Engineers (St. Paul and Minneapolis, Minn.). F. W. Cappelen is President and R. D. Thomas, Secretary.

Philadelphia Association

The Philadelphia Association of Members of the American Society of Civil Engineers was organized on December 22d, 1913. The meetings of the Association are held at the Engineers' Club of Philadelphia, 1317 Spruce Street.

Portland, Ore., Association

On June 18th, 1913, the Portland, Ore., Association of Members of the American Society of Civil Engineers was organized, with the following officers: E. G. Hopson, President; W. S. Turner, First Vice-President; D. D. Clarke, Second Vice-President; G. B. Hegardt, Treasurer; and Charles J. McGonigle, Secretary.

St. Louis Association

At its meeting of October 7th, 1914, the Board of Direction considered and approved the proposed Constitution of the St. Louis Association of Members of the American Society of Civil Engineers.

The following officers have been elected: President, J. A. Ockerson; First Vice-President, Edward E. Wall; Second Vice-President, F. J. Jonah; Secretary-Treasurer, Gurdon G. Black. The meetings of the Association are held at the Engineers' Club Auditorium.

Seattle Association

At the Annual Meeting of the Association, held on January 26th, 1914, the following officers were elected for the ensuing year: Ernest B. Hussey, President; A. H. Fuller, Vice-President; and Carl H. Reeves, Secretary-Treasurer.

(Abstract of Minutes of Meetings)

November 30th, 1914.—The meeting was called to order at the College Club, at 12.15 P. M.; President Ernest B. Hussey in the chair; Carl H. Reeves, Secretary; and present, also, 33 members and guests.

The minutes of the meeting of October 26th, 1914, were read and approved.

The resignation of Mr. S. B. Phillips, as a member of the Association, was accepted.

Discussion of the Engineers' License Bill was opened by Messrs. Joseph Jacobs and Robert Howes, presenting the affirmative and negative sides, respectively, and the subject was discussed further by Messrs. Ralston, Blackwell, Fuller, Reeves, and others.

In accordance with the action of the Association at its meeting of October 26th, 1914, inviting the members of various local technical societies to attend this meeting and discuss the feasibility of the federation of such societies, representatives were present from the Pacific Northwest Society of Engineers, the Engineers' Club, the Seattle Section of the American Institute of Electrical Engineers, the Seattle Section of the American Institute of Mining Engineers, the American Chemical Society, and the Washington Association of Engineers. Discussion of the subject was opened by Mr. S. C. Lindsay, of the American Institute of Electrical Engineers, who was followed by Messrs. Ralston, Magnussen, Blackwell, Dimock, and others.

On motion, duly seconded, it was decided to request each of the local technical societies to appoint three members as a preliminary committee to formulate plans for federation by which each organization would retain its identity, the first meeting of such committee to be subject to the call of the President of the Association.

Mr. Howes called attention to an article in *The Sun* of October 28th, 1914, in which it was stated that University professors would investigate and report on small water-power possibilities in the State free of charge, except for traveling and incidental expenses. Professor Fuller explained that it was not the intention of the University to usurp the field of the engineer in private practice, that the project applied only to small water-powers, which ordinarily would not be used, and that if developments were made, it was the intention of the University to suggest that the owner call in an engineer.

Mr. Ralston called attention to the fact that the Spokane Association was considering the proposed Water Code, and inasmuch as the 1915 Legislature would soon convene, it was felt that the subject should be taken up and reviewed carefully.

The President appointed Professor Fuller a member of the Conference Committee to fill the vacancy caused by the resignation of Mr. E. J. McCaustland.

Adjourned.

December 28th, 1914.—The meeting was called to order at 12.15 P. M., at the College Club; Ernest B. Hussey, President, in the chair; Carl H. Reeves, Secretary; and present, also, 20 members and guests.

The minutes of the meeting of November 30th, 1914, were read and approved.

The President read letters from the Secretary of the Society relating to the scope and functions of Local Associations and announcing a meeting of the Presidents of the Associations to be held in New York City, on January 19th, 1915.

On motion, the Conference Committee was asked to formulate matters to be presented by the representative of the Association at that meeting.

On motion, duly seconded, the President was authorized to appoint a representative to such meeting, in case he was unable to attend.

On motion, duly seconded, the President appointed a Committee of five to make arrangements for the Annual Meeting of the Association, as follows: Messrs. Samuel H. Hedges, Chairman, A. W. Münster, A. S. Downey, Joseph Jacobs, and R. H. Ober.

Adjourned.

Southern California Association

The Southern California Association of Members of the American Society of Civil Engineers (Los Angeles, Cal.) holds regular bimonthly meetings, with banquet, on the second Wednesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained from the Secretary of the Association, W. K. Barnard, 515 Central Building, Los Angeles, Cal.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in Los Angeles, and any such member will be gladly welcomed as a guest at any of the meetings or luncheons.

Spokane Association

At its meeting of March 4th, 1914, the Board of Direction considered and approved the proposed Constitution of the Spokane Association of Members of the American Society of Civil Engineers. Ulysses B. Hough is President.

Texas Association

At its meeting of December 31st, 1913, the Board of Direction considered and approved the proposed Constitution of the Texas Association of Members of the American Society of Civil Engineers. The headquarters of the Association is Dallas, Tex. John B. Hawley is President.

MINUTES OF MEETINGS OF SPECIAL COMMITTEES TO REPORT UPON ENGINEERING SUBJECTS

Special Committee on Valuation of Public Utilities

December 28th, 29th, and 30th, 1914.—The eighth meeting of the Committee was held in Boston. Present, F. P. Stearns (Chairman), Leonard Metcalf, Charles S. Churchill, William G. Raymond, Henry E. Riggs, Jonathan P. Snow, and William J. Wilgus (the full membership of the Committee).

The draft of two chapters of the report, discussed at the previous meeting, was again discussed and revised. The outline of the first half of the report, which had been previously prepared and discussed

in writing, was considered, and the various topics therein were fully discussed. Chapters of the report were assigned to different members for the preparation of drafts to serve as a basis for written discussion in the interval between meetings, and for oral discussion at the next meeting.

Special Committee on Steel Columns and Struts

November 19th, 1914.—The meeting was held at the Bureau of Standards, Washington, D. C. Present, A. L. Bowman (Chairman), James H. Edwards, Rudolph P. Miller, George H. Pegram, and Lewis D. Rights. The following visitors were present: Mr. F. Auryansen, Bridge Engineer, Long Island Railroad; Mr. W. H. Moore, Chairman of the Sub-Committee on Columns for the American Railway Engineering Association; and Dr. G. R. Olshausen, Physicist of the Bureau of Standards.

The Committee inspected a column, Type 10, slenderness ratio, $85 \frac{L}{R}$, which was being placed in the testing machine.

The Secretary read a letter from the Secretary of the Society reporting the request of the Board of Direction that the minutes of the meetings of Special Committees be forwarded for publication in *Proceedings*.

The Committee discussed the Progress Report. The Secretary read a letter from Charles F. Loweth, suggesting that the Board of Direction be asked to change the title of the Committee by omitting from it the words "and Struts." It was decided not to request the change in title.

The Progress Report was approved.

With reference to the suggestion (in the minutes of the meeting of October 6th) as to the advisability of dropping back the loads to 1 000 lb. per sq. in. from 5 000, 10 000, and 15 000 lb. per sq. in., it was decided to leave the matter in the hands of Dr. Olshausen, who will make some investigations and communicate with the Secretary.

The Committee then witnessed the breaking of the test column, and adjourned to hold an informal meeting on the train from Washington to New York.

At this adjourned meeting, Mr. Miller submitted some diagrams of a proposed method of plotting the 8-in. strain gauge measurements. This method was discussed, and Mr. Miller was requested to elaborate upon it, and submit the results to the next meeting of the Committee.

Special Committee on Floods and Flood Prevention

December 15th, 1914.—The meeting was held in the office of the Chairman, 428 Custom House, St. Louis, Mo. Present, C. McD. Townsend (Chairman), John A. Ockerson, and Morris Knowles.

The following communications were read and discussed:

1.—Report of the sub-committee on Rivers Emptying into the Gulf of Mexico, presented by C. McD. Townsend, and a discussion of that report by T. G. Dabney.

2.—Report of the sub-committee on the Ohio River and Its Tributaries, presented by John A. Ockerson.

3.—Two papers from the sub-committee on Rivers Emptying into the Pacific Ocean, viz., (*a*) Flood Control on the Colorado River, by F. L. Sellew, and some remarks thereon by C. E. Grunsky; (*b*) Flood Control of the Sacramento and San Joaquin Rivers, by C. E. Grunsky.

4.—A letter from Daniel W. Mead on the flood conditions in China.

The Committee learned indirectly that J. B. Lippincott had prepared a paper on Rivers Emptying into the Pacific Ocean, but the paper had not been received.

After an informal discussion of these papers and allied subjects, lasting throughout the day, it was decided to prepare a general report in accordance with the views presented, which will then be submitted to the other members of the Committee for their consideration.

Special Committee on Materials for Road Construction

January 21st, 1914.—The meeting was held at the House of the Society. Present, W. W. Crosby (Chairman), A. W. Dean, Nelson P. Lewis, George W. Tillson, and A. H. Blanchard.

The Chairman announced that the Board of Direction had added to the Committee three members, George W. Tillson, Nelson P. Lewis, and Charles J. Tilden, and presented for consideration his resignation as chairman. It was decided that the present chairman and secretary be continued.

The Committee discussed the scope of the work and the formation of sub-committees.

January 22d, 1914.—The meeting was held at the office of Mr. Nelson P. Lewis, New York City. Present, W. W. Crosby (Chairman), A. W. Dean, Nelson P. Lewis, George W. Tillson, and A. H. Blanchard.

The following sub-committees were appointed:

New Forms.—A. W. Dean, Nelson P. Lewis, and H. K. Bishop.

Tests and Analyses.—George W. Tillson, A. H. Blanchard, and W. W. Crosby.

Cost Forms.—Nelson P. Lewis, Charles J. Tilden, and A. W. Dean.

April 6th, 1914.—The meeting was held at the House of the Society. Present, W. W. Crosby (Chairman), H. K. Bishop, Nelson P. Lewis, Charles J. Tilden, and A. H. Blanchard.

Progress reports were submitted on Cost Forms and on Tests and Analyses. A report on New Forms, was presented by letter.

The report of the sub-committee on New Forms, as amended, was adopted.

The Secretary was authorized to re-draft a circular letter to be sent out with the new forms, and also authorized to incur the expense of printing 2 000 circular letters and 10 000 of the new forms.

The scope of the work of the sub-committee on Cost Forms was discussed.

June 4th, 1914.—The meeting was held at the Belvedere Hotel, Baltimore, Md. Present, W. W. Crosby (Chairman), H. K. Bishop, Charles J. Tilden, and A. H. Blanchard.

The routine work of the Committee, and the Chairman's outline of the Committee Report to be presented to the Society in January, 1915, were discussed.

September 19th, 1914.—The meeting was held at the House of the Society. Present, W. W. Crosby (Chairman), A. W. Dean, Nelson P. Lewis, Charles J. Tilden, George W. Tillson, and A. H. Blanchard.

It was decided that the present sub-committees would be continued, with the understanding that the subjects referred to them would be considered under the new title of the Committee, "Special Committee on Materials for Road Construction." (The original title was Special Committee on Bituminous Materials for Road Construction.)

Progress reports of the sub-committees on Cost Forms and Tests of Bituminous Materials were presented and accepted.

The Secretary was instructed to request the Board of Direction to authorize a special meeting of the Society, to be held on the Friday following the Annual Meeting of 1915, for the discussion of the report of the Committee, and to provide opportunity for subsequent written discussion.

The Secretary was instructed to submit to the Board of Direction the request that 3 000 copies of the report, in addition to the number necessary to supply the members of the Society, be printed for the use of the Committee in connection with its work in securing data relative to the use of materials for road construction, and also in connection with the special meeting in January, 1915, if the latter is authorized.

The tentative report was discussed, paragraph by paragraph, amended, or modified, with a view of preparing a re-draft for discussion at a subsequent meeting.

October 17th, 1914.—The meeting was held at the House of the Society. Present, W. W. Crosby (Chairman), H. K. Bishop, A. W. Dean, Nelson P. Lewis, Charles J. Tilden, George W. Tillson, and A. H. Blanchard.

A communication from the Secretary of the Society authorizing the holding of a special meeting of the Society on Friday, January 22d, 1915, for the discussion of the Committee's report, was read.

A report from the sub-committee on Tests of Bituminous Materials was presented, amended, and tentatively accepted.

The draft of the "Progress Report on Materials Other than Bituminous" was presented, amended, and tentatively accepted.

November 2d, 1914.—The meeting was held at the House of the Society. Present, W. W. Crosby (Chairman), H. K. Bishop, A. W. Dean, Nelson P. Lewis, Charles J. Tilden, George W. Tillson, and A. H. Blanchard.

The draft of the section of the report dealing with Nomenclature was presented, amended, and tentatively accepted, except in the case of a few definitions which were not considered.

The section of the report relating to Tests of Bituminous Materials was reconsidered, amended, and tentatively accepted.

The Secretary was instructed to revise the section of the report dealing with Analyses and Tests of Bituminous Materials.

November 14th, 1914.—The meeting was held at the House of the Society. Present, W. W. Crosby (Chairman), A. W. Dean, Nelson P. Lewis, Charles J. Tilden, George W. Tillson, and A. H. Blanchard.

The Secretary reported that arrangements had been made to print 1 000 copies of the 1915 report of the Committee and to hold the type so that additional copies could be printed if required.

The draft of the report, including Appendix C, relating to Analyses and Tests of Bituminous Materials, was discussed, amended, and adopted.

It was decided to omit the section of the report dealing with Non-Bituminous Road Materials.

A vote of thanks to Mr. Crosby, Chairman of the Committee, as an appreciation of the extraordinary amount of work which he has done on the 1915 report, was carried unanimously.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Detroit Engineering Society, 46 Grand River Avenue, West, Detroit, Mich.

Engineers and Architects Club of Louisville, 1412 Starks Building, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont, Canada.

Engineers' Society of Northeastern Pennsylvania, 415 Washington Avenue, Scranton, Pa.

Engineers' Society of Pennsylvania, 31 South Front Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Calle 25 de Mayo 195, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, State Museum Building, Chartres and St. Ann Streets, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Oregon Society of Civil Engineers, Portland, Ore.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 rue Blanche, Paris, France.

Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18–1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ANNUAL REPORT OF THE BOARD OF DIRECTION FOR THE YEAR ENDING DECEMBER 31st, 1914.

In compliance with the Constitution, the Board of Direction presents its report for the year ending December 31st, 1914.

MEMBERSHIP

The changes in membership are shown in the following table:

	Jan. 1st, 1914.			Jan. 1st, 1915.			Losses.				Additions.		Totals.		
	Resident.	Non-Resident.	Total.	Resident.	Non-Resident.	Total.	Transfer.	Resignation.	Dropped.	Death.	Transfer.	Election.	Loss.	Gain.	Increase.
Honorary Members.	.....	5	5	.....	6	6	....	..	..	..	1	.....	....	1	1
Corresponding " .	.....	1	1	.....	1	1	....	..	..	..	.....	.....	....	....	....
Members.....	648	2 627	3 275	658	2 744	3 402	1	14	11	42	†96	*99	68	195	127
Associate Members.	547	2 437	2 984	569	2 679	3 248	96	26	32	16	§108	326	170	434	264
Associates.....	77	97	174	69	97	166	4	5	4	3	.....	8	16	8	‡8
Juniors.....	156	660	816	160	680	840	104	21	29	2	.....	180	156	180	24
Fellows.....	5	12	17	5	10	15	....	..	..	2	.....	.....	2	....	‡2
Totals.....	1 433	5 839	7 272	1 461	6 217	7 678	205	66	76	65	205	613	412	818	406

* 1 Reinstatement.
† 96 Associate Members.
‡ Decrease.
§ 4 Associates, 104 Juniors.

It will be noted that the net increase in membership for the year is 406.

The number of applications received during 1914 was 1 000: 730 for admission and 270 for transfer.

The losses by death reported during the year number 65, and are as follows:

Members (42): Ricardo Manuel Arango, Howard Elmer Arthur, Benjamin Thomas Buffinton, Edward Cook Burns, Robert Cooke Clarkson, Joseph P. Cotton, William Crawford, Horace Crosby, William Roberts Eckart, James Joseph Ferris, Charles Francis, James Lewis Frazier, Martin Luther Gardner, Webster Gazlay, Emil Gerber, Justus Herbert Grant, Bernard Richardson Green, Robert Maxson Greene, John Willis Hays, William August Hunicke, Hurd Clarence Hurd, William Dunbar Jenkins, Thomas H. Johnson, Emil Kuichling, Frank Parsons Lant, Dickinson MacAllister, David Neilson Melvin, Benjamin Franklin Morse, George Alfred Nelson, Alfred Noble, Henry Lewis Oestreich, Peter Alexander Peterson, Arthur Louis Phillips, Frederic John Henry Rickon, Wallace Berkley Riegner, Henry Martyn

Rood, Edmund Job Steere, Lucian Arnold Taylor, Fred Thompson, Joseph Tintorer y Giberga, Nathaniel Turner, George Westinghouse.

Associate Members (16): Ralph Albree, Lawrence Calvin Brink, Duncan Hugh Campbell, Horace Arthur Cook, George John Couchot, Philip Chapin Davis, Murray Forbes, Leon Lincoln Gay, Claude Sanford Haynes, Roger Tifft Holloway, William Paul Hufschmidt, Jesse Sidwell Matson, Edgar Henry Mix, John Marvin Peters, Philip Morris Pritchard, William de Hertburne Washington.

Associates (3): Wallace King, Jr., William Churchill Oastler, John McGaw Woodbury.

Juniors (2): Warren Austin Gates, Aaron J. Zabriskie.

Fellows (2): William Richardson Belknap, Eliphalet W. Blatchford.

LIBRARY

The total contents of the Library and the increase during the year, are shown in the following statement:

	Total Contents.	Increase during 1914.
Bound volumes	24 632	1 275
Unbound volumes	46 255	1 850
Specifications	7 688	268
Maps, photographs, and drawings	4 889	215
Total	83 464	3 608

Of these, 1 482 were donations received in answer to special requests; 69 were donations from publishers; 1 761 were donations received in regular course, and 296 were purchased.

The value of accessions to the Library during the year is as follows, each accession having been valued separately as received:

Donations and exchanges (estimated value)	$2 680.77
296 volumes purchased (cost)	898.67
Binding 429 volumes	502.82
Total	$4 082.26

The following amounts have been expended upon the Library during the year:

Purchases, subscriptions, and binding	$1 401.49
Fixtures, supplies, express charges, etc.	107.66
Total	$1 509.15

The card index now contains about 92 000 cards.

During the year 84 new bibliographies (containing 4 670 separate references) have been made, copies of 21 searches made in previous

years have been furnished, 8 of these having been brought up to date. The total cost of this work, $813.51, has been charged to those for whom it was undertaken.

The total attendance in the Reading Room and Library during the year, was 5 001. This does not include those who use the Library during the semi-monthly meetings.

The Board believes that there are many members of the Society who fail to take advantage of the benefits of its Library facilities because they are not aware of just what those facilities are.

In the belief that our large technical reference Library is one of the most important of the assets of the Society, the Library Committee during the year has looked into the question of its condition with a view of undertaking any improvement which might make it more useful to Engineers. Many people who use this and other technical libraries frequently have been interviewed, and their criticism, as well as suggestions for improvements, have been sought. Other libraries of similar general character have been visited and their work examined in detail. One suggestion that the so-called Dewey System of indexing would be more comprehensive and easy to use has received careful consideration and investigation, with the result that the Committee is satisfied that the system now in use is more simple, more comprehensive, and generally more satisfactory.

One improvement that has been started is the preparation and filing of index cards of all references to current technical literature which are published monthly, and it is believed that this will soon become a valuable labor-saving device, as, if it is kept up, it will be an easily consulted reference to more than a hundred of the best of the engineering publications.

SPECIAL COMMITTEES

During the year the Board has taken up the question of extending the work of the Society through its Special Committees, of which we now have ten, and to this end has authorized, by making up of budgets, the payment of mileage (on the same basis as mileage is now paid to members of the Board of Direction) for attendance at Committee meetings. Payments have also been made for necessary material for conducting experiments and employing suitable assistants for carrying them out. The whole subject of methods under which the work of Special Committees to report on Engineering subjects should be carried out is still under consideration by the Board, and it is hoped that this may soon be formulated, and that this branch of the Society's work may be much stimulated and result in great benefit to the Profession. There has certainly been much more activity in the work of the Special Committees this year than ever before.

PUBLICATIONS

During the year, ten numbers of *Proceedings,* one volume of *Transactions,* and one List of Members, have been issued.

In *Proceedings* the list of references to current engineering literature has been continued, and has covered 148 pages and contained 6 624 classified references to 108 periodicals.

The stock of the various publications of the Society, kept on hand for the convenience of members and others, now amounts to 170 390 copies, the cost of which to the Society, for paper and press work only, has been $26 781.13.

During the year 5 129 volumes of *Transactions* have been bound for members and others in standard half-morocco and cloth bindings.

SUMMARY OF PUBLICATIONS FOR 1914.

	Issues.	Average Edition.	Total Pages.	Plates.	Cuts.
Transactions (Volume LXXVII)..	1	8 200	1 968	40	356
Proceedings (Monthly numbers)..	10	8 150	4 076	41	626
Constitution and List of Members..	1	8 400	318	..	1
Total.....	12	.....	6 362	81	983

The cost of publications has been:

For Paper, Printing, etc., *Transactions* and *Proceedings*....	$35 270.11
For Plates and Cuts.....	2 963.32
For Boxes, Mailing Lists, Copyright, and Sundry Expenses..	850.46
For 25 900 Extra Copies of Papers and Memoirs.....	1 495.87
For List of Members.....	2 213.38
Total.....	$42 793.14
Deduct amount received from sale of publications.....	4 453.85
Net expenditure for publications for 1914.....	$38 339.29

From the Annual Report for 1913, the following statement covering the publications for that year is taken:

SUMMARY OF PUBLICATIONS FOR 1913.

	Issues.	Average Edition.	Total Pages.	Plates.	Cuts.
Transactions (Volume LXXVI)...	1	7 700	2 302	76	655
Proceedings (Monthly numbers)...	10	7 625	3 184	104	497
Constitution and List of Members..	1	7 850	296	..	1
Total.....	12	.....	5 782	180	1 153

The cost of publications has been:

For Paper, Printing, etc., *Transactions* and *Proceedings*...	$38 698.05
For Plates and Cuts.....	3 964.16
For Boxes, Mailing Lists, Copyright, and Sundry Expenses..	667.56
For 41 150 Extra Copies of Papers and Memoirs.....	2 106.31
For List of Members.....	1 964.84
Total.....	$47 400.92
Deduct amount received from sale of publications.....	4 908.46
Net expenditure for publications for 1913.....	$42 492.46

Although a comparison of the respective cost of publications for these two years appears to show a large saving in 1914, it should be stated that it is not possible to make an exact comparison between any two sets of publications. One item alone, that of Plates and Cuts, shows a greater cost in 1913 of $1 000, and to this must be added the cost of printing the extra Plates, as well as the cost of insertion, folding, etc.

MEETINGS

Twenty-seven meetings were held during the year, as follows: At the Annual Meeting, 1; at the Annual Convention, 3; and 23 other meetings, all of which were held at the Society House.

At these meetings there were presented 29 formal papers, 9 of which were illustrated with lantern slides. There were also 5 papers published which were not presented for discussion at any meeting of the Society. The number of members and others who took part in the preparation or discussion of these papers was 275.

The Forty-sixth Annual Convention was held at Baltimore, Md.

The total attendance at the 27 meetings held was about 5 450. The registered attendance at the Annual Meeting was more than 1 400, and at the Annual Convention, 346, but there were many guests present at all these meetings, and also members who failed to register.

At each of the ordinary semi-monthly meetings held during the year collations have been served, and these have been paid for out of the Society funds, in accordance with the action of the Annual Meeting of 1912.

MEDALS AND PRIZES

For the year ending with the month of July, 1913, prizes were awarded as follows:

The Norman Medal to J. V. Davies, M. Am. Soc. C. E., for his paper entitled "Air Resistances to Trains in Tube Tunnels."

The J. James R. Croes Medal to B. F. Cresson, Jr., M. Am. Soc. C. E., for his paper entitled "The Problem of the Lower West Side Manhattan Water-Front of the Port of New York."

The Thomas Fitch Rowland Prize to Burgis G. Coy, Assoc. M. Am. Soc. C. E., for his paper entitled "The Laramie-Poudre Tunnel."

The James Laurie Prize to M. M. O'Shaughnessy, M. Am. Soc. C. E., for his paper entitled "Construction of the Morena Rock Fill Dam, San Diego County, California."

FINANCES

The mortgage debt of the Society has been reduced $20 000 during the year, from $80 000 to $60 000, and the Reserve Fund increased by the purchase of ten New York City Bonds (par value, $10 000) so that this fund now consists of ninety New York City Bonds (par value, $90 000), on which the interest received is $1 350 more than that paid on the mortgage. This statement shows a Reserve Fund of $30 000 in excess of the mortgage, which Reserve Fund should be steadily added to in order to offset the depreciation on the Society House.

The attention of members is invited to the Secretary's statement of receipts and disbursements, and to the general balance sheet which accompanies it, in which the financial condition of the Society is shown.

The reports of the Secretary and Treasurer are appended.

By order of the Board of Direction.

CHAS. WARREN HUNT,
Secretary.

JANUARY 6TH, 1915.

* Compounding Dues Fund, $11 750.00; Norman Medal Fund, $1 000.00; Fellowship Fund, $13 038.28.

GENERAL BALANCE SHEET, DECEMBER 31ST, 1914.

ACCOMPANYING THE REPORT OF THE SECRETARY.

ASSETS.		LIABILITIES.	
Three Lots (Actual cost, $189 632.11) (Estimated value)	$375 000.00	Dues for 1915 paid in advance	$28 576.74
Society Building (cost)	170 955.59	Mortgage debt	60 000.00
Furniture (cost)	20 792.96	Interest accrued on mortgage	200.00
Publications on hand (inventoried cost)	26 781.13	Funds invested in Society House, lots and Library*	28 015.78
New York City non-taxable bonds (cost)	90 392.50	Herbert Stewart Library Fund	1 997.50
Library: Cash expended for books, etc. $20 028.33		Gen. Joseph G. Swift Library Fund	998.75
Donations (estimated) 68 114.46	88 142.79	Surplus (including Reserve Fund of $87 396.25)	681 071.46
Due from Members	9 899.18		
Due from Non-Members	592.27		
Interest accrued on investment	1 049.98		
Cash	17 253.83		
	$800 860.23		$800 860.23

We have examined the books and accounts of the American Society of Civil Engineers, for the year ended December 31, 1914, and certify that the foregoing Balance Sheet is in accordance therewith, and, in our opinion, correctly states the condition of the Society's affairs, as shown by the books.

79 WALL STREET, NEW YORK,
JANUARY 6TH, 1915.

MARWICK, MITCHELL, PEAT & Co.,
Chartered Accountants.

* Compounding Dues Fund, $11 755.00; Norman Medal Fund, $1 000.00; Rowland Prize Fund, $1 222.50; Collingwood Prize Fund, $1 000.00; Fellowship Fund, $13 038.28.

REPORT OF THE SECRETARY FOR THE

To the Board of Direction of the

Gentlemen:—I have the honor to present a statement of Receipts and Disbursements for the fiscal year of the Society, ending December 31st, 1914. I also append a general balance sheet showing the condition of the affairs of the Society.

Respectfully submitted,
Chas. Warren Hunt,
Secretary.

Receipts.

Balance on hand December 31st, 1913, in Bank, Trust Company, and in hands of Secretary		$18 433.43
Entrance Fees	$15 050.00	
Current Dues	81 536.75	
Past Dues	3 820.88	
Advance Dues	28 576.74	
Certificates of Membership	656.80	
Badges	3 037.50	
Sales of Publications	4 453.85	
Library	820.86	
Annual Meeting	2 269.50	
Binding	4 820.33	
Interest	4 229.76	
Compounding Dues	825.00	
Miscellaneous	363.73	
		$150 461.70
		$168 895.13

YEAR ENDING DECEMBER 31st, 1914.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

DISBURSEMENTS.

Salaries of Officers	$15 100.00	
Mileage of Directors	2 903.26	
Mileage of Nominating Committee	482.70	
Work of Committees (Including Mileage, $1 009.72)	3 599.91	
Clerical Help	23 113.48	
Caretaking	1 738.30	
Publications	42 793.14	
Postage	6 879.67	
General Printing	2 755.18	
Office Supplies	1 276.33	
House Supplies	70.47	
Library	1 401.49	
Library Maintenance	107.66	
Badges	2 023.89	
Certificates of Membership	445.00	
Binding	3 620.12	
Prizes	239.61	
Annual Convention	426.85	
Annual Meeting	3 550.12	
Maintenance of House	260.91	
Heat, Light and Water	873.56	
Furniture	129.36	
Interest	2 774.44	
Insurance	161.00	
Current Business	3 081.65	
Petty Expenses	239.81	
International Engineering Congress, 1915	405.60	
Alfred Noble Memorial	953.67	
Advanced on Members' Accounts	47.29	
Bond and Mortgage	20 000.00	
Reserve Fund	9 967.50	
Miscellaneous	219.33	
		$151 641.30
Balance on hand December 31st, 1914:		
In Union Trust Company	$10 412.32	
In Garfield National Bank	5 341.51	
In hands of Secretary	1 500.00	
		17 253.83
		$168 895.13

REPORT OF THE TREASURER.

In compliance with the provisions of the Constitution, I have the honor to present the following report for the year ending December 31st, 1914:

Balance on hand December 31st, 1913		$18 433.43
Receipts from current sources, January 1st to December 31st, 1914		150 461.70
Payment of Audited Vouchers for Current Business, January 1st to December 31st, 1914	$121 673.80	
Payment on principal of bond and mortgage.	20 000.00	
Purchase of bonds, Reserve Fund	9 967.50	
Balance on hand December 31st, 1914:		
In Union Trust Company	$10 412.32	
In Garfield National Bank	5 341.51	
In hands of the Secretary	1 500.00	17 253.83
	$168 895.13	$168 895.13

Respectfully submitted,

JOHN F. WALLACE,
Treasurer.

NEW YORK, JANUARY 6TH, 1915.

ACCESSIONS TO THE LIBRARY

(From December 2d, 1914, to January 2d, 1915)

DONATIONS*

AMERICAN SEWERAGE PRACTICE:

Volume I, Design of Sewers. By Leonard Metcalf and Harrison P. Eddy, Members, Am. Soc. C. E. Cloth, 9½ x 6½ in., illus., 10 + 747 pp. New York and London, McGraw-Hill Book Company, Inc., 1914. $5.00.

This book, it is stated, is the first of three volumes to be issued by the authors, on the principles of theory and rules of practice in the design and operation of sewerage works. In this first volume, they have discussed the design of sewerage systems in detail, supplementing the subject-matter, much of which, it is stated, has been tested practically in their own work, with data, tables, and diagrams to illustrate standard practice. The second volume, it is said, is to deal with the Construction of Sewers and the third with the Disposal of Sewage. The Chapter headings are: The Lessons Taught by Early Sewerage Works; The General Arrangement of Sewerage Systems; Flow of Water in Pipes and Channels; Velocities and Grades; Measurement of Flowing Water; Quantity of Sewage; Precipitation; Formulas for Estimating Storm-Water Flow; The Rational Method of Estimating Storm-Water Run-Off in Sewer Design; Gaging Storm-Water Flow in Sewers; Sewer Pipe; The Design of Masonry Sewers; Examples of Sewer Sections and the Loads on Sewers; The Analysis of Masonry Arches; Street Inlets, Catch-Basins, and Manholes; Junctions, Siphons, Bridges and Flushing Devices; Regulators, Overflows, Outlets, Tide Gates, and Ventilation; Sewage Pumping Stations; Index.

THE PRESERVATION OF STRUCTURAL TIMBER.

By Howard F. Weiss. Cloth, 9½ x 6¼ in., illus., 18 + 312 pp. New York and London, McGraw-Hill Book Company, Inc., 1915. $3.00.

In studying the problems arising during nine years of official work in connection with the wood-preservation industry, the author states that the need of a book on the subject in its broadest sense was repeatedly felt. It was also thought that a textbook on timber preservation would be of assistance to students in forestry and engineering schools where a knowledge of wood utilization is desirable and often necessary. The subject-matter of this book has been taken largely, it is stated, from the author's lecture notes before the civil engineering students at the University of Wisconsin, and his aim has been to present reliable detailed information on the subject which will be of value and use to engineers, foresters, lumbermen, and students. In the Appendices the author has given the minor wood-preserving processes patented, proprietary, and minor wood preservatives used in the United States; lists of manufacturers of creosote and zinc chloride, and lists of wood-preserving plants and fire-proofing plants in the United States; amount of wood preservative used and timber treated, as well as a list of companies equipped to build wood-preserving plants in the United States; specifications for the analysis of creosote; United States Patents in wood preservation; method of analyzing zinc chloride; records of life of timbers, mine timbers, paving blocks, poles, cross-ties, etc. The Contents are: Introduction; Factors Which Cause the Deterioration of Structural Timber; The Effect of the Structure of Wood Upon its Injection with Preservatives; The Preparation of Timber for its Preservative Treatment; Processes Used in Protecting Wood from Decay; Preservatives Used in Protecting Wood from Decay; The Construction and Operation of Wood Preserving Plants; Preserving the Life of Cross-ties from Decay and Abrasion; Prolonging the Life of Poles and Cross Arms from Decay and Insects; Prolonging the Life of Fence Posts from Decay; Prolonging the Life of Piling and Boats from Decay and Marine Borers; Prolonging the Life of Mine Timbers; Prolonging the Life of Paving Blocks; Prolonging the Life of Shingles; Prolonging the Life of Lumber and Logs; The Protection of Timber from Fire; The Protection of Wood from Minor Destructive Agents; The Strength and Electrolysis of Treated Timber; The Use of Substitutes for Treated Timber; Appendices; Index.

Gifts have also been received from the following:

Alabama-R. R. Comm. 1 bound vol.
Am. Inst. of Elec. Engrs. 1 pam.
Am. Inst. of Min. Engrs. 2 vol.
Am. Medical Assoc. 1 pam.
Am. Soc. of Heating and Ventilating Engrs. 1 pam.
Am. Telephone & Telegraph Co. 1 vol., 1 pam.

* Unless otherwise specified, books in this list have been donated by the publishers.

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Baltimore & Ohio R. R. Co. 2 pam.
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California, Univ. of. 1 vol.
Canada-Conservation Comm. 1 bound vol.
Canada-Dept. of Marine and Fisheries. 1 bound vol.
Canada-Dept. of Mines. 1 bound vol., 1 vol., 1 pam.
Canada-Dept. of the Interior. 1 pam.
Canada-Geol. Survey. 1 pam.
Carnegie Endowment for International Peace. 1 pam.
Chicago, Ill.-Municipal Reference Library. 1 pam.
Clarke, D. D. 1 bound vol.
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Colorado-State Highway Comm. 1 pam.
Colorado School of Mines. 2 pam.
Connecticut-Public Utilities Comm. 1 vol., 1 map.
Cooper Union for the Advancement of Science and Art. 1 vol.
Detroit. Mich.-Board of Water Commrs. 1 pam.
Dist. of Columbia-Engr. Commr. 1 vol.
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Dooling, Peter J. 1 pam.
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Illinois-Coal Min. Investigations. 1 pam.
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Illinois-State Water Survey. 1 bound vol.
Indiana-Dept. of Geology and Natural Resources. 1 bound vol.
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Kershaw, G. Bertram. 2 pam.
Koninklijk Instituut van Ingenieurs. 1 pam.
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National Fire Protection Assoc. 1 pam.
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Nevada-Public Service Comm. 4 pam.
New Hampshire-Forestry Comm. 1 pam.
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New London, Conn.-Water and Sewer Dept. 1 pam.
New Mexico-State Corporation Comm. 1 bound vol.
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New York State-Conservation Comm. 6 pam.
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New York State-Public Service Comm., First Dist. 2 pam.
New York State-Public Service Comm., Second Dist. 2 pam.
New York City Record. 1 bound vol.
New York Historical Soc. 1 pam.
New York State Coll. of Forestry. 6 pam.
New York Univ. 2 pam.
North Carolina-Corporation Comm. 1 bound vol.
North Carolina-Geol. and Economic Survey. 1 vol., 2 pam.
North Dakota-R. R. Commrs. 1 map.
North Dakota State School of Forestry. 1 pam.
Ohio-Auditor of State. 1 vol.
Ohio-Commrs. of Public Printing. 1 map.
Ohio-Industrial Comm. 17 pam.
Ohio-State Fire Marshal. 1 pam.
Ohio-State Library. 7 pam.
Ontario, Canada-Bureau of Mines. 1 vol.
Ontario, Canada-Ry. and Municipal Board. 1 vol.
Oregon-Conservation Comm. 1 pam.
Oregon, Univ. of. 1 pam.
Pasadena, Cal.-Auditor. 2 pam.

Paschke, Theodore. 1 pam.
Pennsylvania-Board of Game Commrs. 1 vol.
Pennsylvania-Bureau of Rys. 1 bound vol.
Pennsylvania-Public Service Comm. 4 pam.
Pennsylvania-Senate Librarian. 1 bound vol.
Pennsylvania-State Highway Dept. 1 pam.
Pennsylvania-Water Supply Comm. 2 bound vol.
Perrine, Harold. 1 pam.
Philadelphia, Pa.-Dept. of City Transit. 1 pam.
Pittsburgh, Pa.-Carnegie Library. 1 pam.
Punjab, India-Irrig. Dept. 1 bound vol.
Purdue Univ. 1 vol.
Rhode Island-Commrs. of Inland Fisheries. 1 bound vol.
Rhode Island-Public Utilities Comm. 1 pam.
Royal Inst. of British Archts. 1 vol.
Royal Soc. of Canada. 4 pam.
Saskatchewan, Canada-Dept. of Public Works. 1 pam.
Smithsonian Institution. 3 pam.
Soc. of Am. Foresters. 1 pam.
South Dakota School of Mines. 1 vol., 2 pam.
Tasmania-Dept. of Mines. 1 pam.
Terre Haute, Ind.-City Clerk. 4 pam.
Texas-Dept. of Agri. 1 pam.
Texas, Univ. of. 3 pam.
Travelling Engrs. Assoc. 1 bound vol.
Union Coll. 1 vol.
U. S.-Bureau of Mines. 1 vol.
U. S.-Bureau of Yards and Docks. 1 pam.
U. S.-Census Bureau. 1 pam.
U. S.-Chf. of Engrs. 3 vol., 15 specif.
U. S.-Coast and Geodetic Survey. 1 bound vol., 2 pam.
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U. S.-Dept. of Agri. 2 pam.
U. S.-Director of Public Roads. 1 pam.
U. S.-Forest Service. 1 pam.
U. S.-Geol. Survey. 8 vol., 20 pam., 25 maps.
U. S.-Interstate Commerce Comm. 1 bound vol., 1 pam.
U. S.-Library of Congress. 1 bound vol., 1 pam.
U. S.-Naval Observatory. 1 pam.
U. S.-Reclamation Service. 5 pam.
U. S.-Secy. of Commerce. 1 vol.
U. S.-Secy. of the Interior. 12 pam.
U. S.-Supt. of Documents. 1 pam.
Victoria, Australia-Mines Dept. 1 pam.
Virginia-Corporation Comm. 1 pam.
Wabash R. R. Co. 1 pam.
Ward, C. D. 2 pam.
Washington-State Highway Dept. 1 vol.
Washington Soc. of Engrs. 1 pam.
Washington, Univ. of. 2 pam.
West Ham, England-Town Clerk. 3 bound vol., 2 pam.
West Virginia-Chf. Road Engr. 7 pam.
Western Australia-Geol. Survey. 6 pam.
Wisconsin-Agri. Exper. Station. 1 pam.
Wisconsin-R. R. Comm. 1 pam.
Wisconsin-State Superv. of Inspectors of Illuminating Oils. 1 pam.
Yale Univ. 1 vol.

BY PURCHASE

Hydraulic Motors, with Related Subjects Including Centrifugal Pumps, Pipes, and Open Channels, Designed as a Text-Book for Engineering Schools. By Irving P. Church. New York and London, 1911.

The Incorporated Association of Municipal and County Engineers: International Engineering Congress (Glasgow), 1901. Proceedings of Section 7: Municipal. Edited by Thomas Cole. New York and London, 1901.

The Gas Engine in Principle and Practice, Including Comparison of the Two-Cycle and Four-Cycle Types of Internal Combustion Engines, with Description of Various Designs, etc. By A. H. Goldingham. New York and London, 1912.

Some Considerations Regarding Cast-Iron and Steel Pipes. By John Sharp. New York and London, 1914.

Elements of Modern Field Artillery, U. S. Service. By Harry G. Bishop. Menasha, Wis., 1914.

A Text-Book of Military Hygiene and Sanitation. By Frank R. Keefer. Philadelphia and London, 1914.

American Society for Testing Materials: Proceedings of the Seventeenth Annual Meeting Held at Atlantic City, N. J., June 30th–July 3d, 1914; Vol. 14, Part 1, Committee Reports. Edited by the Secretary. University of Pennsylvania, Philadelphia, Pa., 1914.

Isolation Hospitals. By H. Franklin Parsons. Cambridge, 1914.

The Bacteriological Examination of Food and Water. By William G. Savage. Cambridge, 1914.

The Railways of South and Central America: A Manual Containing Statistics and Other Information Concerning the Important Railways of South and Central America, Mexico, and the West Indies. By Frederic M. Halsey. New York, 1914.

Textbook of Mechanics; Vol. 5: Hydraulics. By Louis A. Martin, Jr. New York and London, 1914.

A Text-Book of General Bacteriology. By Edwin O. Jordan. Fourth Edition, Revised. Philadelphia and London, 1914.

The Blasting of Rocks in Mines, Quarries, Tunnels, etc.: A Scientific and Practical Treatise for the Use of Engineers and Others Engaged in Mining, Quarrying, Tunneling, etc., and for Mining and Engineering Students. By Albert W. Daw and Zacharias W. Daw. Second Edition, with Addenda. New York and London, 1909.

A Short Table of Integrals. By B. O. Peirce. Second Edition, Revised. Boston and New York, 1910.

SUMMARY OF ACCESSIONS

(From December 2d, 1914, to January 2d, 1915)

Donations (including 15 duplicates)	422
By purchase	14
Total	436

MEMBERSHIP

(From December 4th, 1914, to January 7th, 1915)

ADDITIONS

		Date of Membership.
MEMBERS		
HAMILTON, CHARLES FRAZINE. Gen. Mgr., The Northwestern Constr. Co., Box 621, Franklin, Pa.		June 24, 1914
KAST, CLARKE NIGHTINGALE. Asst. Field Engr., Interstate Commerce Comm., Wells Fargo Bldg., San Francisco, Cal.	Jun.	June 4, 1901
	Assoc. M.	June 7, 1905
	M.	Dec. 2, 1914
LONGLEY, FRANCIS FIELDING. Cons. Engr. (Hazen, Whipple & Fuller), 30 East 42d St., New York City.	Jun.	Feb. 28, 1905
	Assoc. M.	Mar. 2, 1909
	M.	Dec. 2, 1914
THOMAS, RALEIGH COLSTON. Chf. Engr., Electrical Comm. of Baltimore, City Hall Annex No. 2, Baltimore, Md.		June 24, 1914
THOMAS, RALPH DANFORD. Asst. Engr., St. Anthony Falls Water Power Co. and Minneapolis Mill Co., Minneapolis, Minn.	Assoc. M.	May 6, 1908
	M.	Dec. 2, 1914
WIGGIN, ERNEST WOODBURY. Cons. Engr., 506 Cutler Bldg., New Haven, Conn.	Jun.	May 5, 1896
	Assoc. M.	May 7, 1902
	M.	Dec. 2, 1914
WORTHINGTON, IRVING. Asst. Engr. and Water Supt., Fresno Canal & Irrig. Co., Griffith-McKenzie Bldg., Fresno, Cal.		June 24, 1914
ASSOCIATE MEMBERS		
ASHLEY, CARL. Field Engr., The T. A. Gillespie Co., 16 East 37th St., New York City.		Dec. 2, 1914
BECTON, JOHN LELAND. Wilmington, N. C.		Dec. 2, 1914
BILLWILLER, ERNEST OSWALD. Civ. and Hydr. Engr. (Henderson & Billwiller), 242 East Main St., Stockton, Cal.	Jun.	Nov. 8, 1909
	Assoc. M.	Dec. 2, 1914
BROWN, ARCHIBALD ALEXANDER. Asst. Engr., Panama-Pacific International Exposition Co., 6433 Harmon Court, Oakland, Cal.		Sept. 2, 1914
CAMPBELL, WILLIAM COOPER. Supt. of Public Works, and City Engr., Box 507, Columbus, Ga.		Dec. 2, 1914
CLARK, JOHN JAMES. Designing Engr., William B. Ittner, 5744 De Giverville Ave., St. Louis, Mo.	Jun.	Sept. 3, 1913
	Assoc. M.	Dec. 2, 1914
DAY, WARREN ELLIS. Care, Utah Power & Light Co., 503 Kearns Bldg., Salt Lake City, Utah.	Jun.	Dec. 6, 1910
	Assoc. M.	Dec. 2, 1914
DE L'EAU, JOHN PEALE. Civ. and Hydr. Engr.; Engr., Union Sugar Co., Betteravia, Cal.		Dec. 2, 1914
FEELEY, WILLIAM PATRICK. Div. Engr., Great Lakes Dredge & Dock Co., 1100 D. S. Morgan Bldg., Buffalo, N. Y.	Jun.	May 2, 1911
	Assoc. M.	Nov. 4, 1914

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
FERNALD, GORDON HILDRETH. Asst. Engr. and Asst. Supt., Sewage Disposal Comm., City of Fitchburg, 172 South St., Fitchburg, Mass.	Dec. 2, 1914
FRASER, DE GENNES. Chf. Engr., Cook County Council; Acting Engr., Gisborne Borough Council, P. O. Box 22, Gisborne, New Zealand.	Nov. 4, 1914
GASCOIGNE, GEORGE BRADLEY. Asst. City Engr., Room 417, City Hall, Cleveland, Ohio.	Nov. 4, 1914
GELDER, ROYAL WILLIAM. Engr. (Lincoln & Gelder), 1112 Eleventh St., Greeley, Colo.	Nov. 4, 1914
GLANDER, JOHN HENRY, JR. Asst. Engr., Charles W. Leavitt, Jr., 1107 Empire Bldg., Birmingham, Ala.	Jun. May 3, 1910 Assoc. M. Nov. 4, 1914
GOSS, OLIVER PERRY MORTON. Cons. Engr., Assoc. of Creosoting Companies of the Pacific Coast and West Coast Lumber Mfrs. Assoc., 909 White Bldg., Seattle, Wash.	Assoc. Feb. 28, 1911 Assoc. M. Dec. 2, 1914
HALL, HOWARD WASHINGTON. City Engr., Douglas, Ariz.	Dec. 2, 1914
HARRIS, GEORGE WILLIAM. Office Engr., Mackenzie, Mann & Co., Ltd., Port Arthur, Ont., Canada.	Dec. 2, 1914
HINES, HOMER ESTLE. Pres., Hines Coal & Lumber Co., Princeton, W. Va.	Jun. May 5, 1908 Assoc. M. Oct. 7, 1914
HORTON, JOHN WILLIAM. Chf. Deputy County Surv., Sacramento County, 2614 California Ave., Sacramento, Cal.	Jun. Sept. 1, 1908 Assoc. M. Dec. 2, 1914
JONES, BENJAMIN EARL. Asst. Engr., U. S. Geological Survey, Water Resources Branch, 52 Montana Bank Bldg., Helena, Mont.	Jun. April 6, 1909 Assoc. M. Dec. 2, 1914
KNISKERN, LEWIS THAYER. 124 West 80th St., New York City.	Jun. Feb. 6, 1912 Assoc. M. Dec. 2, 1914
KRIEGER, ALBERT AUGUST. Res. Engr., Louisville Water Co., 1141 Cherokee Rd., Louisville, Ky.	Jun. June 1, 1909 Assoc. M. Dec. 2, 1914
LACEY, EDWARD PHILIP. City Engr., Bradentown, Fla.	June 24, 1914
LYNCH, EDWARD MELVILLE. City Engr., City Hall, Glendale, Cal.	Dec. 2, 1914
MCKIBBEN, HARRY SEYMOUR. 107 Mulberry St., Warren, Ohio.	Dec. 2, 1914
MAGUIRE, GEORGE. 3703 Park Heights Ave., Baltimore, Md.	Dec. 2, 1914
MERRIMAN, LESLIE WILLIAM. Supt. of Constr., Am. Pipe & Constr. Co., 2721 West Lehigh Ave., Philadelphia, Pa.	Dec. 2, 1914

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
MILLARD, CHANCEY SPENCER. Mgr. and Chf. Engr., Francis S. Swales, Suite 49, Caroline Court, Vancouver, B. C., Canada		Dec. 2, 1914
MONETT, HARRY. Asst. Engr., Spring Val. Water Co., 375 Sutter St., San Francisco, Cal	Jun.	Oct. 3, 1911
	Assoc. M.	Dec. 2, 1914
NOLAN, THOMAS BREW, JR. The Hawarden, 1419 R St., N. W., Washington, D. C		Dec. 2, 1914
PRINGLE, HERBERT LUTHER. Care, United Fruit Co., Santa Marta, Colombia		Sept. 2, 1914
REINHARDT, WILLIAM. Civ. and Hydr. Engr. (Hickey & Reinhardt), 422 Montgomery St., San Francisco, Cal		Dec. 2, 1914
REMINGTON, JOHN CLEMENT, JR. Borough Engr., 601 Market St., Camden, N. J		Dec. 2, 1914
RICE, PHILIP DURKEE. Engr., San Jose Water Co., 374 West Santa Clara St., San Jose, Cal		Dec. 2, 1914
RICHARDSON, ROBERT EARL. City Engr., Longmont, Colo		Dec. 2, 1914
SCHUTT, ALFRED GEORGE. Engr. and Estimator, Irwin & Leighton, Dime Bank Bldg., Detroit, Mich		Sept. 2, 1914
SOUTHWORTH, JAY LA DREW. Asst. Civ. Engr. in Chg., Lock Constr., Barge Canal, R. F. D. No. 5, Rome, N. Y		Dec. 2, 1914
SPIVEY, WILLIS TILLMAN. Gen. Supt., G. Lloyd Preacher, 415 Chronicle Bldg., Augusta, Ga		Dec. 2, 1914
THOMPSON, MORRIS. Engr. and Gen. Supt., Bates & Hudnall, Room 2, Gould Bldg., Tampa, Fla		Dec. 2, 1914
THOMSON, LESSLIE RIELLE. Designer, Dominion Bridge Co., Ltd., 90 Union Ave., Montreal, Que., Canada		Dec. 2, 1914
TUFTS, WILLIAM. 30 Beaufort Rd., Jamaica Plain, Mass	Jun.	June 6, 1911
	Assoc. M.	Nov. 4, 1914
VON BLÜCHER, CARL FELIX KILL-MAR. Civ. Engr. and Surv. (C. F. H. von Blücher & Sons), Corpus Christi, Tex	Jun.	Oct. 30, 1906
	Assoc. M.	Dec. 2, 1914
WACHTEL, LOUIS. Asst. Engr., State Highway Comm., Wells, N. Y	Jun.	Mar. 2, 1909
	Assoc. M.	Sept. 2, 1914
WILBER, JOSEPH FREMONT. Asst. Engr., Hollis French & Allen Hubbard, 88 Pearl St., Boston, Mass		Dec. 2, 1914
WOODRUFF, CHARLES WILLIAM. 320 Henry Bldg., Portland, Ore	Jun.	Jan. 4, 1910
	Assoc. M.	Dec. 2, 1914
WRIGHTSON, FRANCIS GERMAN, JR. Pres., Wrightson, Anderson & Yost, Room 307, California Fruit Bldg., Sacramento, Cal		Sept. 2, 1914
ZIEGLER, ADAM. Tenafly, N. J		Dec. 2, 1914

ASSOCIATE

	Date of Membership.
STONE, WILLIAM GREENE. 18 Mann Bldg., Utica, N. Y....	Dec. 2, 1914

JUNIORS

ALEXANDER, EDWARD PORTER. Engr. and Contr. (Alexander & Farrell), 418 Manhattan Bldg., Duluth, Minn....	Nov. 4, 1914
ANDERSON, WALTER SEIGFREID. 7417 Emerald Ave., Chicago, Ill.....	Dec. 2, 1914
BARZAGHI, ARTHUR JEROME. Treas. and Secy., Barzaghi-Vought Co., Inc., 299 Madison Ave., New York City.	Dec. 2, 1914
BUELL, WILLIAM ELIJAH, JR. 822 New Birks Bldg., Montreal, Que., Canada.....	June 24, 1914
CLARK, HOWARD FOSTER. Asst. Engr., California R. R. Comm., 833 Market St., San Francisco, Cal.....	Dec. 2, 1914
COPELAND, ROBERT MORRIS. Care, Interstate Commerce Comm., Div. of Valuation, Kansas City, Mo.....	Dec. 2, 1914
CROCKER, FRED WILBUR. Engr., Pacific Bridge Co., 985 Front St., Portland, Ore.....	Dec. 2, 1914
DAKIN, ROBERT EDWARD. Asst. Engr., The Connecticut Co., 330 Alden Ave., New Haven, Conn.....	Dec. 2, 1914
GIBBS, WILLIAM WETMORE. Asst. Gen. Mgr., The Phosphate Min. Co., Nichols, Fla.....	Oct. 7, 1914
KRIGBAUM, LOWELL GAYNOR. Care, U. S. Engr. Office, 337 Eddy St., San Francisco, Cal.....	Nov. 4, 1914
LYNCH, CONLAW ROBERT. In Chg., Newport Branch Office, B. Thomas Buffinton, Y. M. C. A., Mary St., Newport, R. I.....	Dec. 2, 1914
MILLER, KARL ANDREW. Instr. in Math. and Surveying, Allegheny Coll., 548 Baldwin St., Meadville, Pa....	Dec. 2, 1914
OGDEN, MERTON MILES. Balboa Heights, Canal Zone, Panama.....	Oct. 7, 1914
ROBERTS, BURKE BROCKWAY. Asst. Engr., James L. Stuart, 917 Illuminating Bldg., Cleveland, Ohio.....	Dec. 2, 1914
WALLER, JOHN MALCOLM. Checker Draftsman, Kansas City Structural Steel Co., 3228 Morrell Ave., Kansas City, Mo.....	Dec. 2, 1914
WHITNEY, CHARLES SMITH. 704 Stewart Ave., Ithaca, N. Y.....	Dec. 2, 1914
WONG, JICK GAM. Senior Asst. Engr., Szechuen-Hankow Ry., Ichang Ry. Station, Ichang, China.....	Oct. 7, 1914

RESIGNATIONS

MEMBERS

	Date of Resignation.
CORNER, CHARLES.....	Dec. 31, 1914
DELANO, FREDERIC ADRIAN.....	Dec. 31, 1914
FRYE, ALBERT IRVIN.....	Dec. 31, 1914

MEMBERS (*Continued*)	Date of Resignation.
HUTCHINSON, CARY TALCOTT	Dec. 31, 1914
JARVIS, CHARLES MAPLES	Dec. 31, 1914
KENNEY, EDWARD FULBISTER	Dec. 31, 1914
LEIDY, GEORGE CRAIG	Dec. 31, 1914
MILLS, CHARLES MALON	Dec. 31, 1914
POST, HENRY WILLIS	Dec. 31, 1914
SCHULZE, HENRY ATHERTON	Dec. 31, 1914
TONE, SUMNER LA RUE	Dec. 31, 1914
WALKER, FRANK HIRAM	Dec. 31, 1914
WOOD, GEORGE	Dec. 31, 1914
ASSOCIATE MEMBERS	
ANDRESS, HARRY R.	Dec. 31, 1914
BRENN, CHARLES FERDINAND	Dec. 31, 1914
CADLE, CHARLES LONGFORD	Dec. 31, 1914
COOPER, KENNETH FARRA	Dec. 31, 1914
DAVIS, ARTHUR ALBERT	Dec. 31, 1914
FENTON, LOUIS GILLESPIE	Dec. 31, 1914
KINGMAN, JOHN JENNINGS	Dec. 31, 1914
KIRBY, WILLIAM FRANKLIN	Dec. 31, 1914
KOCH, JOHN CHRISTIAN	Dec. 31, 1914
MARTIN, WALTER IRVING	Dec. 31, 1914
NEWMAN, ARTHUR TRAVER	Dec. 7, 1914
SHEPARD, EDWARD LEWIS	Dec. 31, 1914
STEVENS, PERLEY EGBERT	Dec. 31, 1914
TYLER, WILLIAM ROGERS	Dec. 31, 1914
WELTON, BENJAMIN FRANKLIN	Dec. 31, 1914
ASSOCIATES	
CURRIER, CHARLES GILMAN	Dec. 31, 1914
MARSH, ALBERT LEREAUX	Dec. 31, 1914
SMITH, CAMERON C.	Dec. 31, 1914
JUNIORS	
AKERLY, HAROLD EDWARD	Dec. 31, 1914
ANDRUS, LEONARD ALEXANDER	Dec. 31, 1914
CARY, RICHARD LUCIUS	Dec. 31, 1914
DURYEA, ROBERT FRANCIS	Dec. 31, 1914
LEE, CHESTER SHERMAN	Dec. 31, 1914
LINCOLN, EDWARD LEWIS	Dec. 31, 1914
MACILVAINE, FRANCIS SHIPPEN	Dec. 31, 1914
MACKRELL, EDWIN ALLAN	Dec. 31, 1914
MCCAFFREY, JOHN WILLIAM	Dec. 31, 1914
PAINE, GEORGE HEBARD	Dec. 31, 1914
ROSSIG, EDGAR WILLIAM	Dec. 31, 1914

JUNIORS (*Continued*)	Date of Resignation.
SIMS, HARRY HILLYER	Dec. 31, 1914
STEWART, WILLIAM JAMES	Dec. 31, 1914
TILLIT, PEDRO ERNESTO	Dec. 31, 1914
WILSON, CLAUDE THOMAS	Dec. 31, 1914
WILSON, RODNEY MELLEDGE	Dec. 31, 1914

DEATHS

BLATCHFORD, ELIPHALET W. Elected Fellow, February 6th, 1873; died January 25th, 1914.

ECKART, WILLIAM ROBERTS. Elected Member, January 5th, 1881; died December 8th, 1914.

GREENE, ROBERT MAXSON. Elected Associate Member, June 1st, 1898; Member, September 1st, 1908; died December 5th, 1914.

HUFSCHMIDT, WILLIAM PAUL. Elected Associate Member, October 4th, 1910; died August 13th, 1914.

KING, WALLACE, JR. Elected Associate, December 4th, 1900; died October 31st, 1914.

ROOD, HENRY MARTYN. Elected Member, December 3d, 1890; died November 24th, 1914.

STEERE, EDMUND JOB. Elected Member, October 1st, 1913; died July 18th, 1914.

Total Membership of the Society, January 7th, 1915, 7 678.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(December 2d, 1914, to January 1st, 1915)

NOTE.—*This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal*, Assoc. Eng. Soc., St. Louis, Mo., 30c.
(2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
(6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
(7) *Gesundheits Ingenieur*, München, Germany.
(8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
(9) *Engineering Magazine*, New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, 432 Fourth Ave., New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News*, New York City, 15c.
(14) *Engineering Record*, New York City, 10c.
(15) *Railway Age Gazette*, New York City, 15c.
(16) *Engineering and Mining Journal*, New York City, 15c.
(17) *Electric Railway Journal*, New York City, 10c.
(18) *Railway Review*, Chicago, Ill., 15c.
(19) *Scientific American Supplement*, New York City, 10c.
(20) *Iron Age*, New York City, 20c.
(21) *Railway Engineer*, London, England, 1s. 2d.
(22) *Iron and Coal Trades Review*, London, England, 6d.
(23) *Railway Gazette*, London, England, 6d.
(24) *American Gas Light Journal*, New York City, 10c.
(25) *Railway Age Gazette*, Mechanical Edition, New York City, 20c.
(26) *Electrical Review*, London, England, 4d.
(27) *Electrical World*, New York City, 10c.
(28) *Journal*, New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal*, Royal Society of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
(31) *Annales* de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand, Brussels, Belgium, 4 fr.
(32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil*, Paris, France, 1 fr.
(34) *Portefeuille Economiques des Machines*, Paris, France.
(35) *Nouvelles Annales de la Construction*, Paris, France.
(36) *Cornell Civil Engineer*, Ithaca, N. Y.
(37) *Revue de Mécanique*, Paris, France.
(38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
(39) *Technisches Gemeindeblatt*, Berlin, Germany, 0, 70m.
(40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfg.
(41) *Electrotechnische Zeitschrift*, Berlin, Germany.
(42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chaussées*, Paris, France.
(44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
(45) *Colliery Engineer*, Scranton, Pa., 25c.
(46) *Scientific American*, New York City, 15c.
(47) *Mechanical Engineer*, Manchester, England, 3d.
(48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany, 1, 60m.
(49) *Zeitschrift für Bauwesen*, Berlin, Germany.
(50) *Stahl und Eisen*, Düsseldorf, Germany.
(51) *Deutsche Bauzeitung*, Berlin, Germany.
(52) *Rigasche Industrie-Zeitung*, Riga, Russia, 25 kop.
(53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria, 70h.
(54) *Transactions*, Am. Soc. C. E., New York City, $12.
(55) *Transactions*, Am. Soc. M. E., New York City, $10.
(56) *Transactions*, Am. Inst. Min. Engrs., New York City, $6.

(57) *Colliery Guardian,* London, England, 5d.
(58) *Proceedings,* Engrs.' Soc. W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
(59) *Proceedings,* American Water-Works Assoc., Troy, N. Y.
(60) *Municipal Engineering,* Indianapolis, Ind., 25c.
(61) *Proceedings,* Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
(62) *Steel and Iron,* Thaw Bldg., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings,* Inst. C. E., London, England.
(64) *Power,* New York City, 5c.
(65) *Official Proceedings,* New York Railroad Club, Brooklyn, N. Y., 15c.
(66) *Journal of Gas Lighting,* London, England, 6d.
(67) *Cement and Engineering News,* Chicago, Ill., 25c.
(68) *Mining Journal,* London, England, 6d.
(69) *Der Eisenbau,* Leipzig, Germany.
(71) *Journal,* Iron and Steel Inst., London, England.
(71a) *Carnegie Scholarship Memoirs,* Iron and Steel Inst., London, England.
(72) *American Machinist,* New York City, 15c.
(73) *Electrician,* London, England, 18c.
(74) *Transactions,* Inst. of Min. and Metal., London, England.
(75) *Proceedings,* Inst. of Mech. Engrs., London, England.
(76) *Brick,* Chicago, Ill., 20c.
(77) *Journal,* Inst. Elec. Engrs., London, England, 5s.
(78) *Beton und Eisen,* Vienna, Austria, 1, 50m.
(79) *Forscherarbeiten,* Vienna, Austria.
(80) *Tonindustrie Zeitung,* Berlin, Germany.
(81) *Zeitschrift für Architektur und Ingenieurwesen,* Wiesbaden, Germany.
(82) *Mining and Engineering World,* Chicago, Ill., 10c.
(83) *Gas Age,* New York City, 15c.
(84) *Le Ciment,* Paris, France.
(85) *Proceedings,* Am. Ry. Eng. Assoc., Chicago, Ill.
(86) *Engineering-Contracting,* Chicago, Ill., 10c.
(87) *Railway Engineering and Maintenance of Way,* Chicago, Ill., 10c.
(88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
(89) *Proceedings,* Am. Soc. for Testing Materials, Philadelphia, Pa., $5.
(90) *Transactions,* Inst. of Naval Archts., London, England.
(91) *Transactions,* Soc. Naval Archts. and Marine Engrs., New York City.
(92) *Bulletin,* Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
(93) *Revue de Métallurgie,* Paris, France, 4 fr. 50.
(95) *International Marine Engineering,* New York City, 20c.
(96) *Canadian Engineer,* Toronto, Ont., Canada, 10c.
(98) *Journal,* Engrs. Soc. Pa., Harrisburg, Pa., 30c.
(99) *Proceedings,* Am. Soc. of Municipal Improvements, New York City, $2.
(100) *Professional Memoirs,* Corps of Engrs., U. S. A., Washington, D. C., 50c.
(101) *Metal Worker,* New York City, 10c.
(102) *Organ für die Fortschritte des Eisenbahnwesens,* Wiesbaden, Germany.
(103) *Mining and Scientific Press,* San Francisco, Cal., 10c.
(104) *The Surveyor and Municipal and County Engineer,* London, England, 6d.
(105) *Metallurgical and Chemical Engineering,* New York City, 25c.
(106) *Transactions,* Inst. of Min. Engrs., London, England, 6s.
(107) *Schweizerische Bauzeitung,* Zürich, Switzerland.
(108) *Southern Machinery,* Atlanta, Ga., 10c.
(109) *Journal,* Boston Soc. C. E., Boston, Mass., 50c.
(110) *Journal,* Am. Concrete Inst., Philadelphia, Pa., 50c.
(111) *Journal of Electricity, Power and Gas,* San Francisco, Cal., 25c.

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Limitations in the Construction of High-Tension Direct-Current Machines.* A. Scherbius. (Abstract from *Elektrische Kraftbetriebe und Bahnen.*) **(73)** Dec. 18.
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Notes on Coal-Mining in the State of Illinois, United States of America.* Samuel Dean. (Paper read before the North of England Inst. of Min. and Mech. Engrs.) (106) Vol. 48, Pt. 1.

Hydraulic Stowing in the Gold-Mines of the Witwatersrand.* B. C. Gullachsen. (Paper read before the North of England Inst. of Min. and Mech. Engrs.) (106) Vol. 48, Pt. 1.

An Instrument for the Detection of Firedamp in Mines.* F. J. Turquand. (Paper read before the South Staffordshire and Warwickshire Inst. of Min. Engrs.) (106) Vol. 48, Pt. 1.

Tests on False (or Split) Links for Cut-Chain Braes.* John T. Wight. (Paper read before the Min. Inst. of Scotland.) (106) Vol. 48, Pt. 1.

A Portable Electrical Gas-Detecting Device for Use with Miner's Lamps.* George J. Ralph. (Paper read before the North of England Inst. of Min. and Mech. Engrs.) (106) Vol. 48, Pt. 1.

The Rosehall Signal-Indicator.* James Black. (Paper read before the Min. Inst. of Scotland.) (106) Vol. 48, Pt. 1.

Miners' Electric Lamps Compared with the Combustion-Tube Oil-Lamp.* E. A. Hailwood. (Paper read before the Midland Inst. of Min., Civ. and Mech. Engrs.) (106) Vol. 48, Pt. 1.

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A Playground for a Small City.* Warfield Webb. (60) Dec.

Unit Costs of Bituminous Carpet Treatment and Bituminous Macadam by the Penetration Method on Two Roads in Illinois. (86) Dec. 2.

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Municipal—(Continued).

The Location and Width of Highways and the Securing of Rights of Way. Austin B. Fletcher. (Paper read before the Am. Road Congress.) (86) Dec. 2.
Road Economics. J. E. Pennybacker. (Paper read before the Am. Road Congress.) (96) Dec. 3; (86) Dec. 2.
Road Building with Industrial Equipment.* (14) Dec. 5.
Handling 400 Tons of Stone per Day with Auto Trucks. (14) Dec. 5.
Oneida Street Crossing under Milwaukee River.* (14) Dec. 5.
Methods and Cost of Resurfacing Water Bound Macadam with Rocmac Macadam. J. H. Jackson. (From Annual Report of the Queen Victoria-Niagara Falls Park.) (86) Dec. 9.
Unit Costs of Resurfacing Portions of the Niagara River Road in Queen Victoria Park, Canada.* (86) Dec. 9.
Hauling Gravel with Motor Truck and Trailers: A Service Test in Concrete Road Construction.* (86) Dec. 9.
Some Practical Notes on Brick Road Construction. James M. McCleary. (Paper read before the Northwestern Road Congress.) (86) Dec. 9.
Methods and Cost of Removing an Asphaltic Macadam Road Surface, Reworking the Old Material and Relaying It as Asphaltic Concrete.* G. C. Dillman. (86) Dec. 9.
A Heavy Cut for a Street at Kansas City.* (13) Dec. 10.
Pavement Problems; Contrasts of American and Foreign Practice. Henry Welles Durham. (Abstract of paper read before the Am. Road Congress.) (13) Dec. 10.
Pavement Problems and Experience in San Francisco.* James M. Owens. (13) Dec. 10.
Improvement of Ordinary Country Roads. S. P. Hooker. (From paper read before the Am. Road Congress.) (96) Dec. 10.
An Automatic "Traffic Squad" at Lawrence.* (14) Dec. 12.
Practical Hints on Proper Methods of Maintenance for Concrete Pavements.* William M. Kinney. (14) Dec. 12.
Maintaining Macadam Streets in Kansas City; Experience with Pure Asphaltic Oils and Continuous Maintenance Contracts. Clark R. Mandigo. (14) Dec. 12.
Expenditures for Permanent and Perishable Features of Roads; Percentages of Total Cost which Should be Applied to Foundations, Drainage Structures, Alignment and Grades. (14) Dec. 12.
Thin Asphalt Block Pavement for New York State Highways.* Lowell Grossman. (14) Dec. 12.
Ideals in City Planning. Harrington Emerson. (Abstract from paper read before the Civic League of Cleveland.) (19) Dec. 12.
The Last Word in Brick Pavement.* (76) Dec. 15.
Standard Small Culverts Recommended by the Illinois Highway Commission.* (86) Dec. 16.
Methods and Cost of Constructing a Bituminous Carpet on Concrete Roads, with Notes on General Maintenance. F. H. Whitlow. (86) Dec. 16.
Location and Construction of Highways in Mountain Country.* F. W. Harris. (13) Dec. 17.
New Asphalt Plant at Montreal.* Daniel J. Hauer. (96) Dec. 17.
Some Requirements of Road Specifications with Special Reference to Rolling. W. W. Crosby. (Paper read before the Am. Assoc. for the Advancement of Science.) (86) Dec. 23.
Maintenance and Repair of Pennsylvania State Roads. (86) Dec. 23.
Patching Sheet Asphalt with Bituminous Concrete. (86) Dec. 23.
Bituminous Macadam by the Cold Mixing Method. Irving W. Patterson. (Paper read before the Atlanta Road Congress.) (96) Dec. 24.
Wood-Block Expansion Joint for Concrete Alley Pavements; Built-Up Strip Used in Baltimore to Protect Joints of Concrete Slabs in Narrow Roadways.* (14) Dec. 26.
Pipe Subways for the Public Utilities of Chicago. Louis Dumond. (Abstract of Report to Commission on Downtown Municipal Improvements.) (14) Dec. 26.
Dry Masonry Walls for Highway Embankments.* (14) Dec. 26.
Traffic and the Methods and Cost of Road Maintenance in Massachusetts and a Comparison with English and French Conditions. W. D. Sohier. (Paper read before the Am. Road Congress.) (86) Dec. 30.
Widening a Business Street at St. Paul, Minn.* (13) Dec. 31.
Repairing and Resurfacing Bituminous Pavements.* Samuel H. Lea. (13) Dec. 31.
How Small Communities May Have Good Roads. Logan Waller Page. (46) Jan. 2.

Railroads.

Railway Classification Yard Lighting. D. P. Morrison. (58) Oct.
The Delivery and Handling of Miscellaneous Freight at the Boston Freight Terminals.* Harold Pender, H. F. Thomson and C. P. Eldred. (65) Oct.
The Locomotive Stoker. J. C. F. Street. (61) Oct. 20.
Thirty Years of Locomotive Progress in Egypt. E. L. Ahrons. (12) Nov. 27.
New Union Passenger Station at Kansas City, Mo.* (18) Nov. 28.

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Railroads—(Continued).

Electrified Terminal of the B. & O. R. R. at Baltimore.* J. H. Davis. **(18)** Nov. 28.
Progress on the Newark Terminal.* **(17)** Nov. 28.
The Parcel Post and Its Effect on Railway Revenues. V. J. Bradley. **(65)** Dec.
Painting Locomotives and Steel Cars. Milton L. Sims. (Paper read before the Central Ry. Club.) **(25)** Dec.
Jersey Central Steel Passenger Cars.* **(25)** Dec.
Baltimore & Ohio Milk Refrigerator Car.* **(25)** Dec.
Locomotive Front Ends, 1853-1913.* C. T. Rommel. **(25)** Dec.
Most Powerful Pacific Type Locomotive.* **(25)** Dec.
Express Refrigerator Cars; Illinois Central R. R.* **(21)** Dec.
0-6-2 Tank Engines; Taff Vale Railway.* **(21)** Dec.
Design of an Automatic Train Stop.* W. J. Zabel. **(36)** Dec.
The Parana Railway of Brazil.* F. E. Lawrence. **(36)** Dec.
A Problem in Economics of Mountain Railway Location.* J. G. Sullivan. **(36)** Dec.
Notes on Catenary Construction of New York, Westchester and Boston Railway. Sidney Withington. **(3)** Dec.
An English Railway Trainshed.* **(13)** Dec. 3,
Alloy-Steel Rails. **(13)** Dec. 3.
Passenger Locomotives for the Great Northern.* **(15)** Dec. 4.
Piercing the Selkirk Mountains for a Five-Mile Tunnel.* **(14)** Dec. 5; **(15)** Dec. 11.
Rail Sections as an Element in Steam and Electric Traction.* P. H. Dudley. (From *General Electric Review.*) **(19)** Serial beginning Dec. 5.
Improvements at the Englewood Locomotive Terminal and Car Repair Plant, L. S. & M. S. Ry., Chicago.* **(18)** Dec. 5.
A New Cast-Steel Clamp for Guard-Rails.* **(13)** Dec. 10.
The Railway Problem and Its Solution. Samuel Rea. (Paper read before the Chamber of Commerce.) **(15)** Dec. 11.
Failures or Breakdowns of Locomotives.* Robert Weatherburn. **(12)** Serial beginning Dec. 11.
Instructions for Roadway and Track Men on Federal Valuation; Abstract of Second Tentative Draft Recently Issued by Director of Valuation, Interstate Commerce Commission. **(14)** Dec. 12.
Scrap-Handling Plant of Boston and Albany Railroad.* **(14)** Dec. 12.
Pacific Type Locomotives, Chesapeake & Ohio Railway.* **(18)** Dec. 12.
Tunnel and Terminal Electrification of the Canadian Northern Ry.* W. C. Lancaster. **(18)** Dec. 12.
An Ambulance Train on an English Railway.* **(13)** Dec. 17.
Rail Joints and Tie Spacing.* **(13)** Dec. 17.
Tunnel Lining by Compressed Air.* **(15)** Dec. 18.
Extensive Electrification on the St. Paul.* **(15)** Dec. 18.
Heavy 4-8-2 Locomotive for South African Railways. **(12)** Dec. 18.
New American Tunneling Record at Rogers' Pass; Progress of 817 Feet was Made Through Slate Material during Month of November on Canadian Pacific Railway's Work. **(14)** Dec. 19.
Looping the Loop in the Alps.* J. F. Springer. **(46)** Dec. 19.
The Operation of Large Yards. A. M. Umshler. (From *Illinois Central Magazine.*) **(18)** Dec. 19.
Ventilation of Allegheny Summit Tunnel, Virginian Ry.* F. F. Harrington. (From *General Electric Review.*) **(18)** Dec. 19.
New Passenger Station of the D., L. & W. R. R. at Morristown, N. J.* **(18)** Dec. 19.
Operating Plans for the Electrified Division of the C. M. & St. P.* **(17)** Dec. 19.
Two Pacific Type Locomotives of High Power.* **(15)** Dec. 25.
Automatic Signals on the Lehigh & Hudson River.* **(15)** Dec. 25.
The Decision Granting the Five Per Cent. Rate Advance. **(15)** Dec. 25.
Pneumatic Track Tamping, Portable Outfits in Use on New York Central & Hudson River Railroad.* **(14)** Dec. 26.
Pacific Type Locomotives for the Delaware & Hudson Co.* **(18)** Dec. 26.
Electrification of London & Port Stanley Railroad.* **(17)** Dec. 26.
Frog Guard Rails of Special Design.* **(13)** Dec. 31.
L'Electrification du Chemin de Fer de Luleo à Narvik (Suède et Norvège).* **(33)** Dec. 1.
Das Eisenbahnverkehrswesen auf der Weltausstellung in Gent 1913. Guillery. **(102)** Serial beginning Oct. 1.
Die Ursachen der Schlaglochbildung an den Radreifen der Lokomotiven.* J. Jahn. **(102)** Oct. 1.
Zum Durchschlag des Grenchenbergtunnels.* **(107)** Nov. 21.
Elektrische Beleuchtung von Personenwagen nach dem vereinfachten System Dick.* Emil Dick. **(41)** Serial beginning Nov. 26.
Wechselstrom-Triebwagen auf der Strecke Spiez-Frutigen der Lötschbergbahn.* **(41)** Nov. 26.
Wirkungsweise der Zugbeleuchtungsanlage.* **(41)** Dec. 3.

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Railroads, Street.

Pressed-Steel Cars for the Chicago Elevated.* (17) Dec. 5.
Reinforced Concrete Poles for Railways.* (17) Dec. 5.
New Cars of Seattle Municipal Railway.* H. J. Kennedy. (17) Dec. 12.
Analysis of Stresses in Chicago Elevated Steel Car.* H. A. Johnson. (17) Dec. 12.
A Novel Portable Substation for the Berkshire Street Ry.* (13) Dec. 17.
The New York Municipal Car, Trucks, Brake, Rigging and Draft Gear.* (17) Dec. 26.
Die Kabelführung städtischer Schnellbahn.* (41) Nov. 12.

Sanitation.

Design of Two Residential Sewage Treatment Plants, Including Settling Tanks of Imhoff Type.* Samuel A. Greeley. (86) Sept. 16.
Sewage Disposal Works at Leeds.* (12) Nov. 27.
Experimental Plant for Treating Sewage at Brooklyn, N. Y.* George T. Hammond. (60) Dec.
Concrete Septic Tanks.* (67) Dec.
Electric Cooking and Heating in Private Houses.* W. A. Gillott. (77) Dec. 1.
New Sewage Pumping, Screening and Sterilizing Station at Daytona, Fla.* (86) Dec. 2.
Some Possibilities in Ventilation.* A. H. Barker. (Paper read before Univ. College.) (11) Dec. 4.
Construction Methods and Plant for Diversion and Drainage Works; Forty-Three Million Yards of Ditch and Levee Work for Little River Drainage District in Missouri.* (14) Dec. 5.
Investigation of Sewer Air Following Boston Explosion. H. W. Clark. (14) Dec. 5.
Construction of the Metcalf Ave. Sewer, Borough of the Bronx, New York City.* G. L. Christian. (13) Dec. 10.
Draining Land by Wells; Concrete Drain Head.* (13) Dec. 10.
A Comparison of the Economy of Powdered Coal, Oil and Water Gas for Heating Furnaces. C. F. Herington. (13) Dec. 10.
Construction of Concrete Septic Tanks.* Percy H. Wilson. (101) Dec. 11.
Aeration Experiments with Activated Sludge. W. H. Duckworth. (Paper read before the Assoc. of Managers of Sewage Disposal Works.) (104) Dec. 11.
Gas-Heated Hot-Water Supplies.* W. B. Cobb. (Paper read before the Midland Junior Gas Assoc.) (66) Dec. 15.
Construction Plant and Methods Employed on the North Shore Intercepting Sewer, Sanitary District of Chicago.* M. A. Berns. (86) Dec. 16.
Recommended General Procedure in Sewage Works Operation.* (Report of Committee of the Am. Public Health Assoc.) (86) Dec. 16; (13) Dec. 17.
Sewage Intercepting Chamber and Settling Tank for a Public Institution at Geneva, Ill.* (13) Dec. 17.
Plumbing Equipment in Mercantile Building.* (101) Dec. 18.
A Recent Development of the Sewage Problem. Edward Ardern. (Paper read before the Assoc. of Managers of Sewage Disposal Works.) (104) Dec. 18.
Emergency Garbage Disposal in Chicago; Acid Treatment in Vats and Burial in Clayholes under Successive Layers of Ashes Proves to be a Successful Temporary Measure.* George B. Young. (14) Dec. 19.
Tests Controlling Sewage Plant Operation. (14) Dec. 19.
Unwatering Carson Lake.* L. D. Davenport. (16) Dec. 19.
The Manufacture of Concrete Sewer Pipe. (101) Dec. 25.
Sewers Cleaned with Scrapers to Pass Ball Test; Methods and Costs of Work, Involving Pipe from 8 to 18 Inches in Diameter, at Carlisle, Pa.* Clark A. Bryan. (14) Dec. 26.
Reducing the Cost of Drainage Excavation. (14) Dec. 26.
Report of N. C. G. A. Committee on Heating, Ventilation and Refrigeration. George S. Barrows. (24) Dec. 28.
An Exhibit of Modern Street-Cleaning Apparatus: Refuse Collection.* (13) Dec. 31.
Preliminary Report on Emscher Tanks and Kindred Sewage-Clarification Processes. K. Thumm and C. Reichle. (Abstract from Communications of the Royal National Inst. for Water Hygiene in Berlin-Dahlen.) (13) Dec. 31.
A Snow Removal Plan for New York City. (Abstract of Report by J. T. Fetherston.) (13) Dec. 31.
Heating Equipment for Large Greenhouse.* George W. Loeber. (101) Jan. 1.
Zweckmässige Gestaltung der Fensternischen, in denen Heizkörper Aufstellung finden. H. Chr. Nussbaum. (7) Oct. 10.
Die neuen Sielbauten der Stadt Altona.* von Mouillard. (80) Oct. 22.
Die Warmwasserheizungs-und Warmwasserbereitungsanlage in der Privatklinik des Sanitätsrates Dr. med. E. Lampé in Frankfurt a. M.* (7) Oct. 24.
Die Sanierungsarbeiten der Ueberschwemmungszone des brasilianischen Staates Rio de Janeiro.* Friedr. Freise. (7) Oct. 24.
Untersuchungen über elektrische Heizung in Stockholm.* Carl A. Rossander. (41) Dec. 3.

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Structural.

Reactions in a Three-Legged Stiff Frame with Hinged Column Bases. N. M. Stineman. (4) Nov.
Building Laws. Henry Rusch. (Paper read before the Engrs'. Club of St. Louis.) (1) Nov.
Permeability Tests on Gravel Concrete.* Morton O. Withey. (4) Nov.
Aluminum Alloys as Surface Protection for Metals Subject to High Temperatures. (13) Dec. 3.
Sulphite Solution Plant of Reinforced Concrete; Four 99-Foot Towers, 8.5 Feet in Diameter with a Special Tile Lining, Contain the Limestone.* (14) Dec. 5.
Dustless Concrete Floors.* (14) Dec. 5.
Erecting 36-Ton Girders with Steel Shears.* (14) Dec. 5.
Measuring Shocks of Vehicles and Vibrations of Buildings.* A. Boyer-Guillon. (From *La Science et la Vie.*) (19) Dec. 5.
Acoustics of Auditoriums.* F. R. Watson. (Abstract from *Bulletin 73*, Eng. Experiment Station, Univ. of Illinois.) (19) Serial beginning Dec. 5.
The Care and Maintenance of Gas Holders. J. H. Braine. (Paper read before the Am. Gas Inst.) (24) Serial beginning Dec. 7.
Using Water as Load in a Floor Test. F. R. McMillan. (13) Dec. 10.
The Palmer Memorial Stadium at Princeton University.* (13) Dec. 10.
Favorable Tests of Elmira Brick. (14) Dec. 12.
Behaviour of Reinforced Concrete in Fires; in Three Instances Buildings were not Injured by Burning of Inflammable Contents or Destruction of Adjoining Structures. (14) Dec. 12.
Cost of Floors for Buildings. (14) Dec. 12.
The Design of Railroad Ice Storage Houses. (Report of Committee of the Am. Ry. Bridge and Building Assoc.) (86) Dec. 16.
A New Flat-Slab Reinforced Concrete Floor with Striking Features.* (13) Dec. 17.
The Fire at the Edison Works at West Orange, N. J.* (13) Dec. 17.
Rapid Destruction of Fireproof Buildings (Edison Works).* Sterling H. Bunnell. (20) Dec. 17.
Large Floating Gravel-Washing Plant in Indiana.* (14) Dec. 19.
Disastrous Fire at Edison Factory.* (14) Dec. 19.
Painting Defects, Their Causes and Prevention.* G. W. Thompson. (Paper read before the Maintenance of Way Master Painters' Convention.) (15) Dec. 18.
Erecting 40-Ton Girders at a Height of 250 Feet Above the Street.* (14) Dec. 26.
Manila Rope Fastenings; Tests of Tensile Strength of Common Hitches Indicate That Eye-Splices are Most Satisfactory Considering High Strength They Develop.* (14) Dec. 26.
Righting a Twenty-Thousand-Ton Grain Elevator.* (46) Dec. 26.
Design Features of the Open Hearth Building of the Pennsylvania Steel Co., Steelton, Pa.* (86) Dec. 30.
Portable Hoist Towers for Concreting.* (13) Dec. 31.
The Failure of the Hippodrome Arcade, Youngstown, Ohio.* (13) Dec. 31.
An Example of Fire-Resistant Windows and Structure.* (13) Dec. 31.
The Corrosion of Iron. L. C. Wilson. (9) Serial beginning Jan.
Ermittelung der Abmessungen einfach und doppelt bewehrter Eisenbeton-Querschnitte bei reiner Biegung sowie exzentrischem Druck und Zug. Stark und Dankelmann. (51) Sup. No. 22.
Der Neubau der Berliner Sternwarte auf dem Babelsberg.* W. Eggert. (49) Pt. 10.
Pfahlgründung mit Holzeisenbetonpfählen.* Neufeldt. (40) Aug. 12.
Die Grosse Maschinenhalle auf der Buchgewerbe-und Graphik-Ausstellung in Leipzig.* Kottke. (69) Sept.
Der Knickwiderstand Gegliederter Eisenstäbe.* Siegmund Schwätzer.* (69) Sept.
Das Natürliche Recht des Eisens auf Aesthetisierung.* Karl Stapf. (69) Serial beginning Oct.
Die Halle für den Kessel- und Gestellbau des neuen Transformatoren-Werkes der Siemens-Schuckertwerke in Nürnberg.* M. Foerster. (69) Oct.
Einfluss des elektrischen Stromes auf Beton. (80) Oct. 24.
Fundamentplatte in geteilter Eisenbetonkonstruktion.* H. Martin. (78) Nov. 6.
Mehlmagazin mit Backgebäude.* Ernst Schick. (78) Nov. 6.
Eine Studie über Zugspannungen. H. Wald. (50) Nov. 12.

Topographical.

Cross-Sectioning.* J. A. Macdonald. (96) Nov. 26.

Water Supply.

Construction Features of the North Side Reservoir of the Water Works of the City of Pittsburgh.* E. E. Lanpher and J. S. Cole. (58) Oct.
Ice Troubles in Hydro-Electric Plants. (96) Nov. 26.
Water Supply Main for Atlantic City, N. J.* (60) Dec.
The Hydro-Electric Power Plants at the Wachusett Dam, Clinton, Mass.* B. C. Thayer and E. R. B. Allardice. (109) Dec.
Twelve Miles of Concrete Pipe Laying, Eastern Colorado Power Co. (67) Dec.

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Water Supply—(Continued).

Selection and Use of Concreting Materials at M'Keesport Water Softening and Filtration Works. **(67)** Dec.
The Ultra-Violet Rays and Their Application for the Sterilization of Water.* M. von Recklinghausen. **(3)** Dec.
First Large American-Built Humphrey Pump.* Charles C. Trump. **(64)** Dec. 1.
British Practice in the Design of Reinforced Concrete Reservoirs. E. R. Matthews. (Paper read before the Univ. College, London.) **(86)** Dec. 2.
A Small Slow Sand Water-Filter for the Estate of J. P. Morgan.* John H. Gregory. **(13)** Dec. 3.
A New Hydraulic Stop Valve.* C. W. Larner. **(13)** Dec. 3.
Public Water Supply for Cities—Some General Considerations. W. H. Dittoe. **(96)** Dec. 3.
Stream Flow Investigations.* M. C. Hendry. **(96)** Dec. 3.
Administration of Water Rights in British Columbia. William Young. **(96)** Dec. 3.
Economical Duty of Pumps.* Frank H. Carter, Assoc. M. Am. Soc. C. E. **(14)** Dec. 5.
Bacteriological Standard for Water on Common Carriers. **(14)** Dec. 5; **(13)** Dec. 17.
Solving the Silt Problem; Reservoirs Suggested for Muddy Streams of the Southwest. Louis C. Hill. **(14)** Dec. 5.
Method of Lining Wrought Steel and Cast Iron Pipe with Cement.* **(86)** Dec. 9.
Storage Dam at Eugenia Falls.* G. R. Heckle. **(96)** Dec. 10.
The Senfrot Chemical Injector.* **(11)** Dec. 11.
Thermophones in Kensico Dam.* Wilson Fitch Smith. **(13)** Dec. 10.
Water Sedimentation, Coagulation and Mechanical Filtration at Waco, Texas.* **(13)** Dec. 10.
One Year's Work of the U. S. Reclamation Service. **(14)** Dec. 12.
Grouting Foundations for Gravity-Section Dam.* Harold S. Johnston. **(14)** Dec. 12.
Discharge of Water Through Nozzles; Derivation of Formula for Use with Slide Rule and Adapted to Introduction of any Efficiency Factor Desired. F. W. L. Peebles. **(14)** Dec. 12.
Some Observations on Water Works Valuation. J. W. Ledoux. (Paper read before the Pennsylvania Water Works Assoc.) **(86)** Dec. 16.
Bow River Hydro-Electric Plants.* **(96)** Dec. 17.
Hydraulic Plant, Joliette, Que.* **(96)** Dec. 17.
Plant Tests of a Low-Head Hydro-Electric Development.* F. Nagler. **(13)** Dec. 17.
A Direct-Reading Volumetric and Velocity Meter for Measuring Fluid Flow.* **(13)** Dec. 17.
The Narrows Flexible Joint Submarine Siphon.* John P. Hogan. **(14)** Dec. 19.
Reservoir Sites on the Colorado River.* Louis C. Hill. **(14)** Dec. 19.
Winter Operation of Stoney Gates.* **(14)** Dec. 26.
Some Recent Tests of High-Power, High-Speed Water Turbines; Supplementary Article Dealing with Holyoke Test 2 359, Giving 93 Per Cent. Maximum Efficiency, and 2 363, Giving 90.7 Per Cent.* S. J. Zowski. **(14)** Dec. 26.
Cost of Excavating Drainage Ditches with Steam and Electric Machines; Comparisons of Drag-Line and Suction Dredges Operated on the North Side Minidoka Project of the United States Reclamation Service. **(14)** Dec. 26.
A Diesel Engine Irrigation Plant.* Max Loewenthal. **(111)** Dec. 26.
A Discussion of the Elements of Water Works Accounting.* R. A. Stevenson. **(86)** Dec. 30.
The Protection of Riveted Steel Pipe. Leonard Metcalf. **(86)** Dec. 30.
Design Features of the Proposed Water Supply and Purification Works, Corpus Christi, Texas.* **(86)** Dec. 30.
The Influence of Reservoir Bottoms on Stored Water.* Wilson Fitch Smith. **(13)** Dec. 31.
Outline of Data to be Obtained for a Report on the Feasibility of any Irrigation Project. H. F. Robinson. **(13)** Dec. 31.
Construction Camp, Elephant Butte, N. M.* **(13)** Dec. 31.
Irrigation Flumes of Ingot Iron.* **(13)** Dec. 31.
Umbau einer offenen in eine geschlossene Enteisenungsanlage und dabei gesammelte Erfahrungen. Krecke. **(39)** Serial beginning Oct. 5.
Der Gebrauch des Chlorkalks zur Trinkwassersterilisation.* E. A. Gieseler. **(7)** Oct. 24.

Waterways.

Long-Term Variations in Stream Flow, Croton and Hudson Rivers.* Edward H. Sargent. **(13)** Dec. 3.
The Floating Caisson for the Panama Canal Locks.* Lewis A. Mason. **(13)** Dec. 3.
Flood-Protection Work on Fall Creek at Indianapolis, Ind.* L. F. Wertz. **(13)** Dec. 3.
Lock Gates for Dalles-Celilo Canal.* **(14)** Dec. 5.

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Waterways—(Continued).

Tidewater Activities at Halifax.* **(96)** Dec. 10.
Flow Regulation on the Grand River. **(96)** Dec. 10.
The Gulf Stream, Causes that Govern its Course, and its Effect on Climate.* M. W. Campbell Hepworth. (Paper read before the Royal Geographical Soc.) **(19)** Dec. 12.
New York State Barge Canal.* Ray Francis Yates. **(46)** Dec. 12.
A Gravel Dredge Which Delivers Graded Materials. Albert Gottschalk. **(14)** Dec. 12.
Permanent Power Distribution System at Panama Canal.* **(62)** Dec. 14.
Methods of Filling and Dredging for a Jersey City Freight Terminal.* **(13)** Dec. 17.
Circumventing Niagara Falls.* Bernard Farrows. **(19)** Dec. 19.
Why Rivers Overflow, How Floods May Be Prevented.* Arthur E. Morgan. **(19)** Dec. 19.
Report on Flood Prevention in China.* **(14)** Dec. 19.
Pennsylvania Coal Dock at Sandusky.* **(15)** Dec. 25.
Lumber Mattresses for Bank Protection in Louisiana; Caving Levees are Surfaced by Reinforced Concrete above Low Water Level and by Stone-Loaded Mats of Woven Boards Below.* **(14)** Dec. 26.
Toronto Breakwater to Curb 10-Foot Waves; Heavy Concrete Blocks Molded Separately, to be Set in Walls by Cranes and Capped with Mass Concrete.* **(14)** Dec. 26.
Die Grundlagen der Wasserbewegung in unseren Flüssen.* H. Krey. **(49)** Pt. 10.
Die Beton- und Eisenbetonbauten der neuen Emder Hafenanlagen.* E. Krakau. **(78)** Serial beginning Nov. 6.

*Illustrated.